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THE

NATURE OF CHOLERA

INVESTIGATED;

WITH

A SUPPLEMENTAL CHAPTER ON TREATMENT;

ADDRESSED TO JUNIOR PRACTITIONERS.

BY

JOHN GEORGE FRENCH, F.R.C.S.

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" It is only when we are wandering and lost in the mazes of particulars, or entangled in fruitless attempts to work our way downwards in the thorny paths of applications, to which our reasoning powers are incompetent, that Nature appears complicated:—the moment we contemplate it as it is, and attain a position from which we can take a commanding view, though but of a small part of its plan, we never fail to recognise that sublime simplicity on which the mind rests satisfied it has attained the truth."——Sir J. Herschel.

SECOND EDITION.

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PREFACE

TO

THE SECOND EDITION.

THE following pages were written with the hope of overthrowing a host of prejudices concerning Cholera, and of establishing a knowledge of its nature from which *principles* of treatment would proceed as a necessary conclusion. The principles alone were enforced, while all minuteness of detail was studiously avoided.

The confused and even chaotic state of mind which has always existed on the subject is sufficiently evident from the fact that every

article of the Materia Medica has been declared a specific by some advocate or other.

The Author is aware that a book is often consulted hastily for the purpose of obtaining, without study, the results of a writer's experience; he has therefore added a chapter on treatment to the present edition, which is to be considered as addressed to students and junior practitioners.

He trusts that this apology will save him from the charge of impertinence, to which, did he not offer it, he feels that its introduction would justly render him obnoxious. To the Essay alone he directs the attention of the Profession generally. He has put the question in a logical form, in order that any fallacy in the argument may the more easily be detected.

It is hoped that the induction thus made from all the important facts concerning the

disease, is attended with an explanation of its nature not less consistent and complete than has yet been obtained in the case of any of the exanthemata; the greater simplicity of Cholera, and its more striking and unmasked phenomena, rendering this an easier task than the unravelling of the more complicated web of the former specimens of zymotic disease.

Great Marlborough Street,
October 1853.

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THE

NATURE OF CHOLERA

INVESTIGATED.

In 1832, the Author published the following view of the Nature of Cholera*:

"That the alimentary canal becomes subjected to a process which altogether supersedes digestion, and by this process a large quantity of fluid is produced as an excretion, which rapidly diminishes the bulk of the blood; with the mechanism of this production we are as yet unacquainted.

"That this constitutes the disease.

"That in some instances the disease continues its progress till the death of the patient; but, in

* Letter to the Board of Health. London, *Rivington*, 1832.

the very large majority of cases when left to nature, the disease ceases when it has produced a state of collapse, varying in intensity.

" That this state of collapse is remarkable in the phenomenon, that the patient himself complains of heat felt throughout his body, while to the by-stander he appears to be perfectly cold.

" That extreme thirst attends this state of collapse.

" That though fluids requiring digestion are rejected by the stomach, and therefore with difficulty find their way into the system,—cold water, which is most grateful to the patient, becomes gradually received and retained.

" That the blood, in consequence of a change in its constituent principles, by which it becomes more viscid, is thereby rendered less easy of circulation.

" That though the evacuations of the morbid excretion cease, retching continues, which assists,

mechanically, the passage of the blood, and produces a general relaxation of the system ; hence diminishing the obstacles to the circulation of this fluid.

" That when the system becomes replenished with fluid to a certain extent, and the circulation of the blood thus acquires a certain degree of energy, the gall duct, which remained closed during the progress of the disorder, now permits the flow of the bile. The bile, frequently in a vitiated state becomes ejected by vomiting (this action still assisting the circulation), a further flow of bile then gradually prepares the alimentary canal for a renewal of its proper functions.

" That though no specific fever follows the disease, the shock thus given to the system commonly produces the most severe effects in the form of local inflammations and congestions in the various viscera."

It is remarkable that on the very day on which this was published, the memorial of Dr. Hardwick Shute, addressed to the Board of Health, appeared also in the weekly Medical Journals. Dr. Shute's

paper strongly confirmed the truth of this view; but the well known fact that Cholera has proved fatal before the alimentary canal had become affected, led the author of this inquiry to further and stricter investigation. His aim is to prove that the disease essentially consists in paralysis or diminished power of action of the heart;—and to show that the consequent symptoms constitute the means by which Nature attempts to remedy the evil, analogous to the remedial means she employs in repairing any mechanical injury to the animal frame.

The plan adopted is to show,—first, the analogy of Cholera with other diseases;—then, to explain its own peculiar nature;—and, lastly, to lay down principles of treatment, which can alone be derived from an accurate knowledge of the nature of the disease.

PROPOSITIONS.

I.

That Cholera depends on a deleterious influence exerted on the system; in this respect resembling many diseases, as small-pox, and others.

II.

That the deleterious impression once made on the system, death may be immediately occasioned, either by its violence, or by its peculiar effect on the idiosyncrasy of the person attacked;—but that generally, a new and salutary process is established by Nature for resisting its effects.

III.

That the manner in which Nature produces a change of conditions necessary for the safety of the patient, is, that of putting into requisition the extensive surface of the alimentary canal for the exudation of a large quantity of fluid, thus rapidly diminishing the bulk of the blood, and effecting

other changes in its nature, required by the necessity of the case.

IV.

That any further phenomena remarkable in this disease, are either effects of this salutary process, or accidents not necessarily connected with it.

Proposition the First.

" *That Cholera depends on a deleterious influence* " *exerted on the system, in this respect resembling* " *many diseases, as small-pox, and others.*"

We may assume it as an axiom that a deleterious influence is exerted on the system in an attack of Cholera; and the cause or nature of this influence has afforded to writers on the subject a wide field for speculation. Some accredited authors refer the proximate cause of Cholera to certain electrical conditions:—but as it would be idle to refer to all the hypotheses which have been entertained on the subject, it is sufficient to remark that the one which ascribes the cause of Cholera to a *poison*, seems to afford the most rational idea of the nature of the disease; let us see how far it be tenable.

All that can be accomplished towards establishing the fact of a poison producing the disease (as it cannot be demonstrated) is to show the extreme probability of it.

The first argument, then, in favour of this idea

is, that the mode in which the disease occurs in its most vehement form, that of instant death, admits of explanation in no other way.

The second argument is afforded by the analogy of other *epidemics*, as the exanthemata, typhus, plague, &c., which are generally admitted to depend on poison contained in the atmosphere, and with which class of diseases, namely the zymotic*, Cholera is now identified.

In order to support the first argument, the following quotations may not be deemed unnecessary :—

" Several instances were heard of at Hooghly†, and other places, of natives being attacked with the disease whilst walking in the open air; and having fallen down, retched a little, and complaining of vertigo, blindness, and deafness, they expired in a few minutes. Mr. Gordon reports to the

* Zymotic, the Registrar-General's word to express blood or fermentative diseases from ζυμοω, to ferment.

† Orton on Cholera, page 8.

Medical Board of Bombay several cases precisely similar. At Bellary, a native tailor was attacked, as was believed, by this disease (for it was during its prevalence) and instantly expired, as it is said, with his work in his hands, and in the very attitude in which he sat when it came on." Captain Sykes, in a letter published in the work above alluded to, states that " when the disease first commenced its ravages at Punderpoor, three hundred and fifty people are described to have died in one day, tumbling over each other lifeless in the public streets." Mr. Coates on the same occasion observes, " the number of deaths at Punderpoor in a few days were estimated at three thousand; and the patients are described as having been knocked down dead as if by lightning."

Bell also says*, " a man in high health and spirits accompanies his companions to bathe; he is seized while in the water with vomiting and purging, or with spasm, is brought immediately to a surgeon, and is found in what I have called the second stage of the disease.

* Bell on Cholera, page 19.

" Or a man goes to bed perfectly well, and is roused at three o'clock with a call to stool, animal heat has already failed, and in three hours he is dying."

In all phenomena affecting animals the nervous system is so largely concerned that it can never for a moment be absent from our minds ; when no evident lesion of other tissues exists, even those who most diligently inquire into the nature of organic lesion at once refer to the nervous system for an explanation of phenomena which may present themselves, well knowing that mysterious influences are exerted on this tissue, though in a manner beyond the reach of our present means of investigation. It has hitherto been deemed sufficient to trace the action of the poisons of the zymotic diseases to the *blood*. Thus Mason Good, speaking of exanthemata*, says, " all concur in evincing the existence of morbid and specific *poisons in the blood*, acting the part of animal ferments, converting the different fluids into their own nature, exciting the commotion of fever and being eliminated on the surface

* Study of Medicine, Vol. iii. p. 2.

as the best and most salutary outlet to which they can be carried, by the very fever which they thus excite."

It is, however, insufficient to trace the action of poison to the blood; it is necessary to inquire what is the effect of poison contained in the blood upon vital organs, through the medium of the nervous system.

Proposition the Second.

"*That the deleterious impression once made on* "*the system, may produce death immediately, either* "*by its violence, or by its effect on the idiosyncrasy* "*of the person attacked; but that generally a new* "*and salutary process is established by Nature for* "*resisting its effects.*"

If we are sufficiently satisfied that the cause of the disease is the existence of a poison, then the questions naturally arise—what is the nature of

the poison;—and what is the mode of its operation on the nervous system?

The chemical nature of all epidemic poisons whatever has hitherto escaped the detection of the most accomplished chemists; but the nature of the Choleraic poison being entirely unknown, let us the more closely watch its effects.

The poison of epidemics differs from other poisons in the very uncertain operation of its action on individuals exposed to its influence; a certain portion of the population only is affected by it at all, while those who do become affected experience its attack in such various degrees of intensity, as can be explained only on the principle of idiosyncrasy, so many examples of which we witness in the effects of ordinary articles of diet.

All poisons remarkable for the *rapidity* of their effects exert their influence on the brain, or on the heart. In Cholera, every one is struck with the normal condition of the brain, while the severe affection of the circulation is no less obvious. To

the heart, therefore, we must refer the action of the poison producing Cholera*.

How then does this poison affect the heart?

Two phenomena attend the lesion of the circulation:—pulsation is diminished, and there is a change in the condition of the blood itself. This alteration depends principally on the colour being darker, the consistence thicker, with less power of coagulation than in the natural state. Every one who practises venesection knows that there is a correspondence between the pulsation of the vascular system, and the appearance of the blood when abstracted.

When the pulsation is extremely forcible, venous blood often assumes a tint nearly approaching to the arterial hue; possessing the power of coagulating firmly, and therefore exhibiting a small mass of crassamentum with a large quantity of serum. It is equally well known that the fluidity of the blood in this condition is also increased. In Cholera, then, the opposite condition to this

* See note at page 25.

obtains in proportion to the diminished action of the heart.

Magendie* concluded from experiments on Cholera patients, that the change in the blood is, simply that the entire mass of the blood is rendered venous in consequence of the failure of the heart's action; that the elasticity of the arteries enables them to propel their contents into the veins, but that the *vis a tergo* in these vessels is not sufficient to carry on the circulation: stagnation of the blood in the veins results; from this he inferred the altered condition of the blood, and the blue colour of the patient.

But Magendie afterwards found that arteries contained black blood, though not so black as that contained in the veins; that this blood is rendered red by *long* exposure to atmospheric air, but even then not so red as healthy blood; and that there was a remarkable alteration in its constituent principles: he also found that there was no abnormal alteration in the respired breath of the Cholera patient.

* Leçons Orales.

From these data Magendie concluded that it is now proved fallacious that the brain requires arterial blood for its proper discharge of function, and that arteries cannot secrete from venous blood.

Now the alteration in the constituent principles of the blood taken from Cholera patients in the state of collapse, according to Dr. Thomson of Glasgow, is as follows:

	Healthy Blood.	Cholera Blood.	
		Specimen 1	Specimen 2
Water	100.	100.	100.
Albumen	10.79	7.34	9.21
Fibrin	5.67	0.57	1.97
Colouring matter with albumen	9.42	41.51	34.8
Salts	1.65	1.81	1.85

The physiologist will arrest his judgment before he allows established doctrines to become unsettled in his mind, when he observes, that there is a great alteration effected in the constituent principles of the blood; that fibrin is considerably diminished in Cholera; that the colouring matter is greatly increased; that as the respired breath is normal, carbon at least is thrown off by the lungs; he will rather infer, that though in the natural state of the

blood, that which has the venous character cannot usurp the place of the arterial, without fatal effects, yet that such changes may be effected in the condition of the blood, as to render life and organic function compatible with a dark hue of this fluid.

When animals are *rapidly* destroyed by tobacco, by the upas antiar, or by arsenic, death appears to result simply from their action in paralysing the heart* ;—" the aörtal cavities being distended with florid blood and the heart itself being insensible to the stimulus of galvanism, while the voluntary muscles are as irritable as after other kinds of death."

Instances of sudden death from Cholera, as in the cases quoted of the tailor at Bellary, &c. have not been known in this country ; nor in these cases have the appearances of the blood in the aörtal cavities immediately after death been recorded, or the possibility of death from Cholera, without change in the appearance of the blood, might have been ascertained.

* Christison on Poisons, p. 18.

It must be remarked, that no chemical change has been observed to take place in the blood till the choleraic discharges have occurred; and that the action of the vascular system seems to influence the condition of the blood; and from these premises we have strong reason to infer that the lesion of the circulation consists essentially in the diminished action of the heart; for such alteration in the state of the blood, as is obvious to our senses, depends, in all probability, on a salutary process for resisting the effects of this condition of the heart. But let us view the question in another light; let us suppose that the blood is poisoned, as is conjectured in the case of the exanthemata, and that the poisoned condition of this fluid renders it incapable of stimulating the heart, or sustaining its action. In this case, still the arrest of the heart's action is really the disease, and the technical expression of it is paralysis of the heart.

Again—we are familiar with the action of digitalis as controlling the heart's action. Here the presence of this substance in the blood modifies the muscular action of the heart—in a word, we say it paralyses the heart, or diminishes its action,

in proportion to the quantity in which it is present.

A source of fallacy respecting the term paralysis is this, namely, that we are only familiar with its use as a term describing a chronic condition; but, in reality, the man who sustains a pressure on the nerve of a limb, arising from uneasy posture, producing the condition known as the "limb asleep," is as much the subject of paralysis (while it lasts) as is he who sustains a pressure from the more permanent source of an extravasated clot of blood.

Thus then we have endeavoured to shew that Cholera is produced by a poison, the specific effect of which is to paralyse the heart.

If paralysis of the heart, therefore, be the disease, and if the removal of the cause be out of our power, what is the most consistent physiological treatment?

In acute paralysis, the most necessary of all things is the repose of the affected organ, and all therapeutical means which tend to this end are salutary. The heart, however, is an organ, the

perfect repose of which is incompatible with life, yet the condition nearest to a state of repose must be the most favourable for its recovery.

Two indications would seem to be clearly pointed out to effect this object :—

1. To diminish the circulating fluid :—

2. To effect such a change in the condition of the blood as would be most compatible with the repose of the heart.

PROPOSITION THE THIRD.

" *That the manner in which Nature effects a* " *change of circumstances, necessary for the safety* " *of the patient, is that of putting into requisition the* " *extensive surface of the alimentary canal for the* " *exudation of a large quantity of fluid, thus* " *rapidly diminishing the bulk of the blood, and* " *effecting other changes in its nature required by* " *the necessity of the case.*"

We have said, the first object for the relief of the patient is the diminution of the circulating fluid. How is this to be accomplished by Nature?

The Indian writers and practitioners who maintained such various opinions respecting the nature and treatment of this disease agree at least, almost universally, on this point, that bleeding is beneficial, and that a very large quantity of blood should be abstracted in order to derive advantage from this operation*.

Under circumstances of vascular excitement, Nature commonly has recourse to hæmorrhage for the patient's relief; but under the opposite condition this is rendered impossible, though an artificial hæmorrhage is sometimes at least highly useful.

In Cholera, therefore, Nature subjects the alimentary canal to a process by which a large quantity of fluid is excreted, and thereby the bulk of the blood is diminished. What is the mechanism of this action?

* Orton, p. 306. Bell, p. 140.

Nothing is more striking than the sympathy which exists between the different organs for their mutual benefit. The loss of appetite where sanguification would be prejudicial;—the excitement of the vascular system when lesion of structure requires reparation;—the relief afforded the brain by the action of the skin as in some exanthemata, are too familiar to require comment: it is difficult to conceive any other principle on which the discharges in Cholera can be accounted for. A *secretion* appears to take place at the nearest point to the centre of circulation at which this can be effected;—the extensive surface of the alimentary canal affords a convenient secreting organ, and also a receptacle for the fluid, which it is requisite should be thrown off from the system, probably to eliminate a poison. It is highly probable then, that the capillary vessels of the alimentary canal are stimulated to the process of secretion by the physiological condition of the system; and, in thus viewing the subject, we do but recognise the same law operating, which causes the secretion of adhesive matter to remedy the effects of an incised wound; and which HUNTER, unable to explain, called the "stimulus of necessity."

We next have to consider how such a change in the condition of the blood might be effected as would be most compatible with the repose of the heart.

Under inflammatory action, the fibrin of the blood is increased: it is this condition which accompanies, if it may not on some occasions produce, vascular excitement. The absence of this principle, therefore, is necessarily the most favourable for vascular quietude, and consequently for the repose of the heart. The fibrin, accordingly, we actually find thrown off from the blood in considerable quantity by the excretion of Cholera, and thus both the diminution of the bulk of the blood, and the necessary alteration in its nature, as well as probably the elimination of the poison, are at once effected by that which is assumed to be the salutary process established by Nature for resisting the effects of the poison of Cholera.

The reasons for believing this affection of the bowels to be salutary are these:—

1st. It has already been shown that Cholera, in

its most intense form, produces death instantly without discharges: all those who recover from its attack experience the peculiar discharges more or less.

2ndly. The analogy of the exanthemata, in which the extensive surface of the skin is put in requisition for the purpose of relieving some internal organ, as the brain in small-pox and scarlet fever, the lungs in measles, &c.

3rdly. The arguments just adduced as reasons why the blood should be diminished in quantity and altered in quality.

4thly. The ultimate recovery of persons who have continued in a state of collapse for a considerable length of time, often extending to a period of three days, and who, in all instances, sustained enormous discharges.

In the physiological arrangements of Nature, the wisdom of anticipation and prevention is everywhere observable. He who has witnessed the dreadful disturbance of the function of the brain, previous to

the eruption of small-pox, and the immediate relief afforded this organ by its appearance, is convinced of the salutary nature of its operation; yet in ordinary cases the eruption takes place before any severe cerebral symptoms are manifested: the eruption will even take place if the case be so mild that the patient does not lose his appetite, and is able to continue his ordinary avocations. The salutary eruption being ordained, it supervenes according to the emergency of the case: so it is with Cholera, the heart, in danger of being overpowered, is relieved by a salutary process peculiar to this disease. With respect to the ultimate recovery of persons who, for a period of three days, continue in a state of collapse, in which the pulse is generally imperceptible, and when perceptible amounts only to a mere flutter, we have reason for believing that under no other circumstances than that of this peculiar alteration of the blood could the patient continue to exist without more active circulation for so long a time; and that, therefore, this alteration is salutary, and the process by which it is occasioned: for it must be remembered that the blood, in a natural state, is a fluid intended by Nature to be constantly circulated, and that, if it remain stagnant in the vessels, clots

would form, and other evils result, which would interfere with its ready dilution and circulation during reaction—the excretion of fibrin is, on this account, therefore desirable.

Note to page 13.

Dr. Taylor, in his valuable work on Poisons (page 19), refers their action to the spinal marrow as well as to the brain and the heart. As cramps in Cholera afford the only indication of affection of the former structure, and as they are not present in some of the worst cases, and are not essential to the disease, the spinal marrow is, therefore, also excluded as well as the brain, leaving only the heart as the organ on which the deleterious influence of the poison of Cholera is exerted.

PROPOSITION THE FOURTH.

"*That any further phenomena remarkable in this* "*disease, are either effects of this salutary process,* "*or accidents not necessarily connected with it.*"

Pathology of Cholera.

Enumeration of Symptoms:—Vomiting—diarrhœa—suppression of the bile, and of the urine—cramps—emaciation—intense thirst—pulse diminished or abolished—alteration of the voice—alteration of the colour of the skin—shrivelled appearance of the integuments—alteration of the appearance of the blood when abstracted—extreme coldness of the surface to the touch of another—coldness of the tongue and breath—sensation of heat felt throughout the body by the patient—jactitation—cold, clammy sweat—mind entire—pain in the epigastric region—in the region of the heart—and often in the situation of the transverse arch of the colon—oppressed respiration—peculiar smell—coma.

Morbid appearances in those who die in the state of collapse:—

Head.—Vessels injected with darker blood than natural—brain drier and firmer than natural.

Thorax.—Pleura and pericardium healthy, but drier than natural. Lungs sometimes gorged with black blood, sometimes extremely collapsed. Heart flabby, sometimes ecchymosed*, both sides distended with black blood:—large vessels similarly distended with the same fluid.

Abdomen.—Peritoneum healthy, but that which invests the stomach and bowels often more or less congested. Liver generally healthy; sometimes partakes of the general abdominal congestion:—gall-bladder distended, sometimes with healthy, sometimes with vitiated bile;—ducts pervious. Stomach and intestines gorged with blood;—the canal contains in considerable quantity the fluid, so commonly compared to gruel, soapy water, or rice water, which constitutes the peculiar discharges:—mucous follicles enlarged;—whitish, opake, viscid substance adherent to the mucous membrane;—mucous membrane softened. Urinary bladder contracted.

Chemical Pathology.—The analysis of Cholera

* Fergus on the Cholera at Vienna.—*Lancet, 23rd June,* 1832.

blood by Dr. Thomson has already been quoted: that of the dejections is said by other chemists to be composed of water, fibrin with albumen, mucus, carbonate, acetate, muriate, phosphate, and sulphate of soda.

Dr. O'Shaughnessy disputes the accuracy of Dr. Thomson's analysis respecting the deficiency of fibrin in Cholera blood, but he admits that the flaky matter contained in the dejections is principally composed of fibrin.

It has been attempted to establish the fact, that the *vomiting* and *diarrhœa* constitute the salutary process by which the fatal effects of the poison producing the disease are to be remedied; and if this be true, then it is evident that, so far from digestion being a function necessary to a person affected with Cholera, the digestive canal is in requisition for a purpose of a directly opposite tendency;—that instead of elaborating material for the supply of, it is engaged in throwing it from, the blood;—the bile can be of no service in this process, and nothing in the economy of Nature is uselessly performed; *bile is not, therefore, now secreted;*—the

gall-bladder, generally full, does not now pour forth its contents to be wasted; but the duct remains closed during the progress of the disorder, until indeed it can again be usefully employed in the animal economy. The accident of the bile flowing into the stomach and intestines has actually once fallen under the writer's observation; during the progress of the peculiar Choleraic discharges, in a woman forty-two years of age, of a very debilitated habit of body, in whom the symptoms, though highly characteristic, did not occur with very great violence. The gall-bladder appeared on this occasion to have emptied itself fortuitously of healthy bile, which it contained: for a moment this circumstance deceived the mind as to the course the disease was taking, but attentive observation immediately annihilated the expectation which was raised; — the evacuations quickly resumed the Choleraic appearance, and the patient died in the state of collapse. The supposition of spasm of the bile duct, which some have conjectured to be the cause of the suppression or retention of the bile, is not supported by any fact.

The connection which exists between the dis-

charges from the skin, the kidneys, and the bowels, is well known. In winter the urine is increased in quantity, in proportion to the diminution of perspiration. If the perspiration be much increased, the bowels are commonly rendered costive, as well as that the urine is diminished in quantity. If then we consider how rapidly the Choleraic fluid is carried off from the blood, and that this fluid contains the very saline substances which are naturally thrown off by the kidneys, we perceive that *their function is anticipated, and their office for the present unnecessary**.

The obscurity in which the nervous function is involved, renders it difficult to account satisfactorily for the painful *cramps* with which the patient is harassed. The circulation is so severely affected, and the muscles themselves are so emaciated from the rapid absorption of fluid in this disease, that it

* Christison (on Poisons, p. 746) quotes a case of poisoning by *digitalis*, in which there was *suppression of the urine for three days.* Among the other symptoms enumerated in poisoning with this substance, are *profuse watery purging, incessant retching and vomiting, sense of heat throughout the body, almost complete stoppage of the pulse, cold sweats.*

is not surprising that cramps should occur; we witness continually the occurrence of this phenomenon from much slighter ostensible causes, and the circumstance of the spasms taking place most frequently in the extremities (where the circulation is most feeble, and where the alteration in appearance is most remarkable), gives us a double argument in support of the assumption that these phenomena constitute the cause of cramps. It is, however, part of the history of Cholera, that among the most severe epidemics recorded in India, where cramps were absent, the disease was most fatal; while in epidemics, most strongly marked by this symptom, recoveries were more frequent. It is certain that they must assist the circulation by the muscular pressure on the veins, a fact familiar to the observation of all who practise venesection, when they direct the patient to compress the fingers in order to increase the flow of blood. Cramp is also a phenomenon which attends excessive hæmorrhage*.

There can be no doubt of the *thirst* being a powerful suggestion on the part of Nature, for the

* See a paper on this subject by the Author, "*Lancet*," September 3, 1842.

necessity of replenishing the system with fluids as quickly as it is in a condition to receive it.

The *alteration of the voice* would appear to depend on the peculiar condition of the lungs;—respiration is imperfectly performed, for the circulation in the lungs being impeded, no vigorous intonation can result from the process.

Of the mode in which animal heat is produced, we are not yet sufficiently informed; but there is no doubt that the circulation is concerned in this process: the *absence of the evolution of heat* seems fairly attributable to the failure of the circulation, while the vital process going on within accounts for the *sensation of heat which is felt by the patient throughout the body.*

The *jactitation and clammy sweat* are symptoms which close the scene in many diseases. Though the *mind is strikingly free from the slightest aberration* in Cholera, as a general rule, yet, shortly before a fatal termination, some delirium will occasionally take place; and the most trifling occurrence of this symptom must ever be regarded

as having the most unfavourable tendency: so seldom does the brain recover itself when once its function has been disturbed in this disease; and the same remark applies to the congestive inflammation or fever, which may form the sequela to this complaint. The Choleraic discharge, a process so new and sudden, must occasionally give rise to intense congestion, and consequently *to pain in the epigastric region;* but that which is often experienced in the situation of the *transverse arch of the colon*, we have been led to think exists only as sympathetic with the heart itself; for we have often witnessed this symptom in cases unconnected with Cholera, where, on post mortem examination, no other lesion has been discovered than morbid changes in the structure of the heart.

The *oppression of the respiration* seems clearly referable to the condition of the heart, for the patient is in a very different state from that of ordinary congestion;—a sense of weight and pain is felt more particularly in the region of the heart, and though he often declares he cannot breathe freely, yet he is able to maintain the recumbent posture.

The *smell* of a Cholera patient is so peculiar, that the disease may be sometimes recognised before the patient is seen; but it is not yet ascertained on what this smell depends.

Coma usually precedes the death of the patient; adults rarely recover when this condition has supervened, but with children this symptom has readily disappeared on the application of leeches.

To the *morbid appearances* which the heart presents, we believe sufficient attention is not generally paid: we have invariably found its texture flabby, compared with that of the muscles, which has been unusually firm.

Of the altered condition of the mucous membrane of the alimentary canal, it may be remarked that this affection is not inflammation, as has been supposed by some writers: all our previous knowledge of this action is at variance with the phenomena presented in Cholera. Majendie has demonstrated by an ingenious experiment the difference between real inflammation and the congestion in this disease; he found that the colouring matter could be easily

forced out of the vessels by injection in portions of membrane apparently inflamed in subjects which had died of Cholera: while, on the contrary, this could never be effected in portions of membrane taken from those who died of inflammation. Congestion and secretion would appear to be the real conditions of this organ in Cholera; and with respect to the pink appearance often observed, it is not surprising that some of the colouring matter should at length appear not only in the membrane itself, but also in the secretion, since, in inveterate cases, little else than this material is left in the blood-vessels, nor is it, indeed, very uncommon for some of the last evacuations to consist of pink fluid.

The mucous follicles are sometimes enlarged, and mucus has been then observed abundant; while in other cases they have been normal, and the mucus has not been remarkable. The mucous follicles are not therefore inferred to be active agents in this disease.

Much has been said of the throwing off of epithelium from the mucous membrane of the

bowels, but the rapid recovery of cases of the most excessive purging, shows that this is not an important symptom.

If we carefully observe the mode in which the nervous function is performed, during the progress of the disease, we do not find that those abnormal conditions, assumed by some writers, have any real existence. Thus the paralysis of the sympathetic or ganglionic system of nerves of Bell, is denied by the fact of the secretion of the milk and of the menstrual fluid. The lesion of the eighth pair of nerves, conjectured by Dr. Thomson, is not affirmed by the condition of respiration.

The asphyxia of Dr. Copland is refuted by the following arguments:—

Dr. Copland's own definition of asphyxia is this:—"Suspended animation proceeding from a primary arrest of the respiratory actions, the other functions being thereby abolished." This definition is quite in accordance with Bichat's view, who, from direct experiment, proved that in asphyxia the function of the heart was continued after the cessation of that

of the brain and lungs. So far from this being the condition in Cholera, we perceive

1*st.* That the *coldness of the breath* shows that the breathing is performed after the failure of the circulation.

2*ndly.* That the function of the brain is notoriously well performed when pulsation has ceased.

And, 3*rdly.* That animation is not suspended until life is extinct.

If the disease do not terminate in death, it may be considered at an end when the peculiar discharges cease: for the phenomena which follow are to be considered as necessary operations for the establishment of reaction, or as accidents, which, though induced by the disease, are yet not necessarily connected with it.

The diarrhœa has now altogether subsided, the poison is probably eliminated, and the bowels remain perfectly tranquil for an indefinite length

of time: not so the stomach, the vomiting continues, by its action driving forward the blood through the congested vessels: the gall-duct too, now permits the flow of the bile which is often in a vitiated state, and thus continues the action of vomiting till the circulation becomes re-established: a further flow of bile then gradually prepares the alimentary canal for a renewal of its proper function.

During all this time the inordinate thirst, so characteristic of the disease, continues*; a thirst which induces the patient to drink many gallons of water, and thus the process of reaction is materially assisted by absorption of water into the blood vessels, as well as by nausea and vomiting as will hereafter be more fully adverted to.

The urine does not generally become secreted till from forty to sixty hours after the commencement of a severe Choleraic attack; and it is often delayed for a longer period than this—four or even five

* The quantity of water said to be taken by a patient in the Greville Street Hospital, amounted to ninety gallons.

days sometimes elapsing before this secretion is re-established.

The symptoms of Cholera, like the symptoms of other diseases, assume every grade of intensity, and it is in proportion to the severity of the attack that the dangerous effects of the sequelæ are experienced.

These still consist in disordered circulation—local congestions and inflammations are liable to occur in one viscus or another, and the brain, stomach, kidney, liver, spleen, and lungs are occasionally attacked with inflammation, and they are here enumerated with some regard to the relative frequency with which they are liable to be attacked.

It sometimes happens that a patient in whom the collapse has been severe, undergoes an imperfect reaction, in which state he may continue from the seventh to the fourteenth day. The extremities in these cases continue cold; the pulse extremely feeble; appetite does not return; pain is not always felt, but a most distressing restlessness is expe-

rienced, and the patient continues perfectly sensible till within a few hours of death.

In these cases no remarkable lesion can be discovered, except of the heart. The parietes of this organ are flabby, while the muscles are firm, and some of the cavities, often the left ventricle, are considerably dilated, the parietes being exceedingly thin.

We have attempted to show, that the brain is still capable of watching over the system in this altered condition;—that the suspended secretions form a part of the salutary process;—that the affection of the respiration has reference merely to the condition of the heart. We have ventured to assume that the sensation of heat which is felt throughout the body by the patient, but more particularly in the epigastric region, depends on the nervous energy being engaged in that process by which the system is so remarkably drained of its fluids; and we have endeavoured to prove that the heart itself is the organ primarily, and most essentially affected.

We trust that some further elucidation of the subject will accrue in the consideration of the

Treatment of Cholera.

If the foregoing arguments have satisfactorily established the position that the disease is produced by a poison, then it is certain that the highest ground on which to conduct the treatment is to administer an antidote.

Now antidotes may be considered as of two kinds.

1st. Chemical.—Those which alter the nature of poisons and render them harmless.

2nd. Physiological.—Those which remedy the morbid effects produced by poisons.

It would appear that the word antidote, when applied in any other sense than to express a substance capable of changing the chemical nature of a poison, should either be used to signify all

appropriate remedial measures taken together, or that its use should be entirely abolished.

Christison, after speaking of the nature of chemical antidotes, says, "The other kind of antidote operates not by altering the form of the poison, but by exciting in the system an action contrary to that established by the poison. On considering attentively, however, the phenomena of the action of individual poisons, it will be found exceedingly difficult to say what is the essence of a contrary action, and still more, how that action is to be brought about. Accordingly, few antidotes of the kind are known. Physiology, or experience, has not yet brought to light any mode of inducing an action counter to that caused by arsenic, and most of the irritant class of poisons. It appears probable that the remote operation of lead may be sometimes corrected by mercury given to salivation, and that the violent salivation caused by mercury may be occasionally corrected by nauseating doses of antimony. But these are the only instances which occur to me at present of antidotes for irritant poisoning, which operate by counter action, *unless we choose to designate by the name of antidote*

the conjunction of remedial means which constitute the antiphlogistic method of cure. In the class of narcotics we are acquainted with equally few constitutional antidotes, although the nature of the action of these poisons seem better to admit of them. Ammonia is to a certain extent, an antidote for hydrocyanic acid, but by no means so powerful as some persons believe; and I am not sure that in this class of poisons we can with any propriety mention another antidote of the constitutional kind."

The advantages of adopting the term *physiological* are these:—1st. That of drawing more widely the distinction between the two kinds of antidotes. 2ndly. Divesting the second kind of antidote of undue influence on our minds; since we see, on Christison's authority, that those antidotes which do not change the chemical nature of poisons, possess no greater effect as remedies (though the best we have) than the principles of therapeutics would teach us to expect; and that therefore all therapeutical means, having the same beneficial tendency, are equally entitled to the name of antidotes.

Nature has yet to be explored for that great desideratum, a chemical antidote for Cholera; no analogous discovery has even as yet been made, unless we admit the antidote of vaccination to the small-pox, the discovery of which, was as little likely to be accomplished *a priori*, as that of an antidote for Cholera; but if we cannot alter the nature of the poison, and therefore prevent its deleterious effects, it is the more necessary that we inquire into the most appropriate physiological means for remedying the effects when they are produced.

We must here revert to what has already been advanced, viz. that the poison of Cholera has a direct tendency to paralyse the heart, and that in order to avert the immediately fatal effect of such an operation, the physiological condition of the patient becomes altered: the blood becomes diminished in quantity (whereby the poison is probably withdrawn) and altered in quality; one measure being thus adopted by what has been called the *vis medicatrix naturæ* for the recovery of the patient, analogous to the beneficial eruption of small-pox, or to the reparative process after

mechanical injury. If this position have been established, then the patient may be considered as under the influence of an antidote of the physiological kind so soon as the Choleraic discharges commence.

The questions now arise—Is this the best physiological condition under which the patient can be placed? If it be, can art assist in establishing this condition, or in regulating it?

The first question may be answered in the affirmative, by the following arguments:—

1st.—That the extreme probability of the utility of the Choleraic discharges has been already shown.

2ndly.—That though the altered condition of the blood is certainly compatible with life, while the heart is quiescent, yet it is not equally certain that it is in a fit state for usual circulation.

3rdly.—That such remedies as would appear to afford the prospect of antidotes to the lesion of the circulation (viz. that of exciting a contrary action)

have been extensively employed in the whole class of stimulants, and have been attended, not merely without success, but with mischievous effects.

4thly.—That there is no reason to believe that any remedies have been serviceable in this disease, which do not admit of explanation on the view here taken of its nature.

If it be necessary that the blood should be diminished in quantity and altered in quality, in order to afford tranquillity to the heart, then it is obvious that stimulants, increasing its irritability, would prove injurious, and general experience has proved them to be so.

Even those writers who most strenuously recommend stimulants, do so from a prejudiced idea that they are indicated by the symptoms, rather than from any actual experience of their utility. Orton recommends stimulants, as strongly "indicated" in this disease; but adds, "in the use of these medicines the principal danger appears to be that of the practitioner *doing too much.*" Bell, when speaking of these remedies, declares "the general

mistake in the treatment has been the administration of too large doses of those medicines which have obtained a high character among practitioners." We here at least see how cautiously stimulants are practically recommended, however strongly they appeared to be indicated to the minds of these practitioners; though we have already referred to the boldness with which these very authors recommended bleeding, a remedy of just an opposite tendency to stimulants.

Sir W. Crichton, in a letter addressed to Sir Alexander Crichton, gives an account of the various modes of treatment adopted in St. Petersburgh by the German physicians. The modes of treatment found most successful were those of Dr. Lemaire and of Dr. Lerche. Dr. Lemaire's treatment consisted in cupping in the region of the præcordia, or moderate bleeding, tartar emetic, and diluents of barley water or milk. Dr. Lerche's plan consisted in small bleeding, or leeches to the præcordia, emetic of ipecacuanha, or tartar emetic in soda water, and camphor given in small doses. These modes of treatment are contrasted with others in which internal and external stimulants were chiefly employed.

The stimulating plan of treatment recommended by Drs. Russell and Barry, is not supported even by the official reports which constituted the data on which their recommendation was founded, for it is only when stimuli either formed a secondary consideration, or were abandoned altogether, that any remarkable degree of success is recorded, as the following quotations will tend to show.

" The strongest stimulants and bleeding were used in a disease of a few hours' duration, according to the instinctive view of the symptoms presented to each practitioner. A milder practice was adopted by others, of giving magnesia in milk to the amount of a drachm or more every half-hour or hour, with the intention of pacifying the vomiting and acting on the bowels by gentle means. *Some considerable success*, which attended the practice, induced for a time, a frequent repetition of it, but the subsequent failure of these means leaves on the face of the report a *doubtful* opinion of their efficacy.

" But the remedy, which is described as being most uniformly successful (when it could be used)

is bleeding, and this even in cases when the pulse was scarcely perceptible at the wrist."

The oxide of bismuth is also highly spoken of as a remedy. Stimulants were indeed used in conjunction with this, but at the same time "plain water ad libitum; but in small quantities at a time, at the temperature of the atmosphere" was allowed.

"Dr. Bloom (chief physician to the Merchants' Cholera Hospital) informed us that he had just been at a numerous meeting of hospital physicians, at which there was a great diversity of opinion as to the best method of treating Cholera, but that the magisterium bismuthi had by far the largest number of suffrages: the greater number had found warm and vapour baths hurtful rather than otherwise; some asserted that bleeding and emetics almost invariably saved the patient."

"Two German physicians, Ysenbech and Brailow, stated publicly and firmly, yesterday, in my presence, at the medical council, that during the preceding eleven days they had treated, at the Custom House Hospital, thirty Cholera patients, *of whom*

they had not lost one. They gave two table-spoonsful of common salt in six ounces of hot water at once; and one tablespoonful of a similar mixture, cold, every hour afterwards. They always begin by bleeding.

"But in the ordinary way of treating the disease, suppose the first stage safely past, very rarely indeed, not five times in the hundred, does the patient return to health without passing through a dangerous fever," &c.

Mr. Searle was himself affected with Cholera. The treatment of his own case consisted almost exclusively in drinking cold water very frequently, yet, being convinced that stimulants are *indicated*, he recommends to others, strong brandy and water —one part spirit to two of hot water*.

The valuable paper of Mr. J. Freeland Fergus, informs us of what happened at Vienna, with respect to the treatment of Cholera.

"The effect of the treatment employed during

* Searle on Cholera.

the Cholera itself was very striking. When ice was used, the reaction was always very violent, and the congestions to particular organs very strong; but these were of an active character, and therefore more under the control of the physician. The indiscriminate employment of strong stimulants in large doses, as opium, camphor, musk, ether, oil of cajeput, especially in the active forms of Cholera, was followed so constantly by a dangerous and soporose state, that after some time they were almost entirely neglected by all the physicians of Vienna."

Extract from Mr. Fergus' tables, relative to the Cholera at Vienna :—

	Cases.	Cured.	Died.
Treated with ice from Sept. 15 till the end of Oct.	100	65	35
Ditto from end of Oct. till 12th Dec.	42	34	8
Ditto stimulants and hot frictions ...	292	128	164
Ditto ipecacuanha alone.....	21	9	12
Ditto ipecacuanha and stimulants ...	37	12	25
Ditto ice and stimulants	48	19	29

"Here then," says Mr. Fergus, "stand on the

one side, bleeding, emetics, ice and sinapisms; and on the other, opium, brandy, camphor, oil of cajeput, sulphuric ether, hot frictions, baths, &c. These last were at the commencement of the epidemic, almost unanimously employed.

"But in so far as the former were found more effectually to stop the course of the disease, to produce reaction, and to give an active character to those congestions which afterwards developed themselves, the use of the latter was almost unanimously abandoned by the physicians of Vienna, except in those cases of exhausting diarrhœa, described as the third form of Cholera (occurring in scrofulous or debilitated habits of body), for though they sometimes put a stop to the symptoms of the disease, and even raised the patients out of those desperate states of congestion or paralysis in one or two cases, yet their use was always followed by the sopor and the worst forms of typhoid fever. Even in the third form they were given only in small doses, never in such quantity as was necessary to produce reaction in the first and second forms."

Having endeavoured to show that the use of

stimulants is neither warranted by experience nor by reason, let us next inquire into the remedial virtues of

Calomel.

This medicine has been used at all times since the disease has been known, and has held a prominent station in materia medica as a remedy for Cholera. Calomel has been exhibited in large doses, as a scruple or half a drachm every hour; or in small doses, as a grain, repeated at very frequent intervals.

Two peculiar effects are known to result from the use of calomel, viz. stimulation of the secreting organs, and stimulation of the absorbents.

As secretion and absorption have generally been assumed to be annihilated in Cholera, this remedy would appear at once to afford an antidote, operating by counter-action, as Christison expresses it.

It has, however, already been observed, that so

far from secretion being annihilated, this process is carried on to an unexampled extent in the form of the choleraic discharge, *superseding*, indeed, *some* of the natural secretions, but the undeniable fact that milk is secreted during the existence of acute Cholera, is a proof that secretion is not essentially suppressed. As to absorption, the attenuated condition of the patient shows that the lymphatic system has been actively employed, but we have endeavoured to show that the object of Nature being to reduce the bulk of the blood, and alter its quality, assimilation is not (during the entire progress of the disorder) probably either a possible or a desirable process. If then it be not tenable that calomel is an antidote operating by counter-action, what pretensions does experience affirm it to possess as a remedy founded on the general principles of therapeutics ?

The pathological view, indeed, on which calomel has been generally given, is to reproduce the so much desired appearance of bile in the evacuations; and Dr. Joseph Ayre who has, perhaps, of all writers, the most strongly insisted on the efficacy of this medicine, thus states his opinion of the

nature of the disease, "that the seat of the disorder is in the liver, and the means suited to the disordered actions of this organ are adequate to restore the other disturbed functions to their healthy condition."

If our view of the nature of the disease be admitted, then so far from the liver being the seat of the disorder, it is not necessarily disordered at all, and though, frequently (for it is not universally the case) the secretion of bile becomes disordered in this disease, this is an occurrence which obtains in almost all constitutional diseases, which are universally admitted not to have their origin in the liver, and is therefore no argument against us. As to the temporary suppression of the secretion, we do not admit that to be proof even of disorder, for reasons before stated.

Now all that is known of the effects of calomel can be explained only on the principle of absorption, but as Dr. Ayre himself admits that "pending the collapse, no absorption of this medicine will take place;" let us, for the sake of argument, refer its action immediately to the nervous tissue.

We shall even in this case be constrained to admit, that though this substance may be capable of affecting the nervous tissue in another state, yet in this disease, it is altogether inert; for experience has established the fact, that whether given in large or small doses, or omitted altogether, exactly the same phenomena hold their course without any modification whatever. But if calomel cannot be serviceable in the state of collapse, it next becomes a question whether it can be so in the state of reaction.

In this condition we do not perceive any argument against its possible utility: stimulation of the secreting organs and of the absorbents, if this action be exerted, cannot be objectionable; and, indeed, he who has witnessed the states of inflammation which sometimes follow reaction, together with a peculiarly altered and viscid condition of the blood, which often attends a comatose condition of the brain at this period, would not fail to recognise in calomel a valuable remedy for anticipating and preventing these conditions, from its known antiphlogistic and attenuating properties.

It is unnecessary to analyse the alleged virtues of the numberless remedies which have been recommended for this disease; it is sufficient to remark that they owe their reputation either to their inertness, or to the mode in which they were administered. Of the former, the oxide of bismuth and magnesia may perhaps be fairly mentioned; of the latter, nitrous acid and potash may afford examples. Nitrous acid was recommended by Mr. Annesley, with the view of oxygenating the system. His mode was to give it largely diluted with water, probably to induce the patient to use it freely; it was also used in the form of bath. We here see at once a source of fallacy, for the question lies between nitrous acid and water. Accordingly when this medicine became the subject of more exact experiment in the hands of others, it soon fell into disrepute, though, in the hands of Mr. Annesley, it was attended with considerable success. Exactly the same explanation applies to the potash. The recommendation of this alkali originated from the circumstance of a Cholera patient, a soldier, having slaked his thirst with some dirty water in which wood ashes abounded; for a sentinel had been placed at the door of the

camp hospital, with strict orders to prevent the ingress of water, so loudly was it called for by the patients, and so injurious was it considered by the medical attendants: accordingly, this man having most unexpectedly done well, and the quantity of the fluid which he had taken being too considerable to be supposed unconnected with his recovery—the credit was awarded to the potash, which maintained its reputation for a time, but lost it, exactly in proportion as it became administered in such a manner as accurately to determine its virtues. Since then it has been shown that the best physiological state for a patient under the influence of the poison of Cholera is, that he should be affected with the Choleraic discharge, we next have to consider if art can assist in establishing or in regulating this process.

Now here, in order to give a clearer view of our meaning, let us have recourse to analogy. In small-pox, for example, though we generally have the eruption appearing when our attention is called to the patient, yet we sometimes witness its attacks in another form: the most violent phrenitis, occurring suddenly, is presented to our view;—

the patient is in this state bled freely, and cold is applied to the head, and then, the phrenitic symptoms being moderated, the eruption, previously altogether suppressed, makes its appearance, and the disease now takes its usual course in the mitigated form.

But it is not inferred that, because a bleeding under such circumstances is beneficial, bleeding in all cases of small-pox is proper. In the generality of cases of this disease, all that is requisite to be attended to in the treatment, is to supply the most harmless and refreshing drink to quench the patient's thirst, and so to regulate the temperature of his apartment that nervous excitement may be moderated. If more than this be necessary, it is because some accident is complicated with the disease, which requires to be remedied on the general principles of therapeutics.

So in Cholera, undoubtedly bleeding has been of the greatest advantage in some cases, appearing even nearly to have superseded the Choleraic discharge, and thus to have cut short the disease, but experience has established the fact that its

effects are injurious if used indiscriminately. We believe that the abstraction of blood either by venesection, or by leeches applied to the epigastric region, is sometimes useful in relieving the congestion consequent on so new and sudden a process as the secretion of the Choleraic fluid, thus enabling that process to proceed more favourably. But in the more intense forms of Cholera, it is well known, that the abstraction of blood is impossible by any means; it will not flow from an open vein, nor can it be abstracted by leeches. In this state there is a sensation of extreme heat felt throughout the body by the patient, though the surface is marble cold to the touch of another; a distressing restlessness is experienced, and an intolerance of the lightest clothing is manifested. It is now that the use of ice is demanded, and its beneficial effect is fully established by experience. It is a well-known property of cold to diminish nervous sensibility: the vascular system is here in a state of intense congestion, and its function is for the present destroyed; and the nervous system is in a state of excitement threatening exhaustion: if relief cannot be administered directly and mechanically to the circulation by abstracting blood

from the vessels, the next best thing is to afford it through the medium of the nervous tissue: and thus, excitement being diminished by the use of ice, the process of secretion is established, and the congestion is relieved.

Here then are two means which art possesses for assisting in establishing and regulating the Choleraic process; the abstraction of blood; and in still severer cases—the use of cold.

When the secretion is effected, it passes away from the system, either by the bowels alone, or is ejected also directly from the stomach by vomiting.

It has been observed by writers that, when in epidemic Cholera vomiting formed the prominent symptom and the diarrhœa was trifling, the disease was seldom fatal.

In such cases, indeed, the disease would appear to be essentially milder for these reasons:—1st. because a smaller portion of the alimentary canal is required by the necessity of the system to be subjected to the process of elimination; and 2ndly,

that the nervous energy of the stomach is not so intensely engaged in this process as to be rendered incapable of the action of vomiting. The advantage of the vomiting itself is considerable, as directly tending to restore the heart's functions by mechanically assisting in driving forward the blood in the congested vessels.

As vomiting is so serviceable, the value of emetics becomes a question. It should be recollected that vomiting forms so general a symptom of the disease, that the probable cause of its absence must be first considered, before recourse is had to emetics. If the patient be extremely collapsed, it may be generally regarded as a sign of the absence of vital power, which will not bear the least further depression or disturbance: whether this be a satisfactory explanation or not, experience has established the fact that powerful emetics not only often fail altogether to act under these circumstances, but they appear to be connected with the fatal result which often speedily follows their exhibition.

There is, however, one condition of the system in which emetics seem peculiarly serviceable. It

has been already said that the respiration is not essentially impaired, but that its abnormal condition merely results from the condition of the circulation: but it sometimes happens that a true dyspnœa supervenes suddenly, the alæ nasi become flapping and pain and distress are experienced in the chest—here we have witnessed the happiest effects result from the exhibition of emetics. When, however, vomiting is spontaneous, it appears to be always beneficial; nor does it appear to be less so, when it is encouraged by the copious draughts of fluid with which the patient is induced to slake his urgent thirst.

There is, however, another class of remedies which should engage our attention, in the consideration of

Saline Medicines.

Organic chemistry is still so little understood, that it is not from this science we can venture to draw inferences in favour of the use of saline remedies. Experience, however, teaches us that saline substances introduced into the system, are quickly passed off by one excretory or another; and it is

well known that certain of these salts have a specific effect on each of these organs. It is not unreasonable to suppose that the kidneys, not called into action for so long a time, should require stimulation, as the stomach often requires a stimulant after long fasting before its function is readily resumed: for this purpose the neutral salts, known to affect the kidney, afford an unobjectionable diuretic.

The muriate of soda abounds so largely in nature, that the fact of itself is a strong presumption of its use in the animal economy. Man uses it with advantage, and its excellent effects are well known to graziers and others interested in the health and condition of the lower animals. It is uniformly found in healthy serum: in the serum of Cholera blood, it is said by those who have analysed this fluid, to be deficient in quantity. If taken into the stomach in large quantities, this salt excites vomiting, but in smaller, it enters the circulation—occasions thirst, and either directly or indirectly stimulates the excretories.

There do not appear to be any disadvantages at

the least to be apprehended from the use of these substances; and the profession is much indebted to Dr. Stevens, for having been highly instrumental in substituting a harmless and probably beneficial class of remedies in the place of medicines of a most injurious and fatal tendency. The theory, indeed, on which Dr. Stevens supports the saline treatment is not admissible; but as we can only repeat the objections which have been raised by those who have already refuted his opinions, we think it unnecessary to enter into the subject.

Thus, as far as the disease itself is concerned, our remedial means are extremely limited, but our minutest attention is required to watch and remedy the effect of accidents which the disorder may occasion, and which consist in local congestions, or inflammation of some internal organ, the most appropriate treatment for which affections is so universally admitted, that it would be superfluous here to enter minutely on the subject, merely observing that the prompt and repeated abstraction of blood in these cases is more necessary, than in any other circumstances where inflammation

occurs; so rapid is its progress, and so fatal is the result.

We do not know of any remedy for that condition in which, as we have before said, the patient lingers, for a period of about seven, or even as long as fourteen days, with feeble pulse, cold extremities, &c., and the cause of which we have referred to organic lesion of the heart.

It must be constantly borne in mind, that the mode in which Nature effects the process of reaction, is this:—

1*st.*—By the absorption of water into the blood vessels.

2*nd.*—By nausea, which produces general relaxation of the system; thus diminishing obstruction to the passage of the blood in the vessels.

3*rd.*—By retching or vomiting, which mechanically assists in driving forward the blood in the congested vessels.

SUPPLEMENTAL CHAPTER

ON

THE TREATMENT OF CHOLERA,

ADDRESSED TO

Students and Junior Practitioners.

I have made use of the analogy of small-pox in some of the arguments contained in the former pages; but as this is a disease with which the student in medicine is more familiar than well-informed, it suits my purpose better just now to remind him that one of the first subjects of treatment presented to his observation is the fracture of bone.

The treatment of this injury is extremely simple, and is indeed almost entirely limited to the preservation of symmetry: but by what remedies is the union of the bone brought about?

The indefatigable industry and careful observations of the most able men have taught us, that we may almost certainly depend on a firm union taking place in a given space of time, without any further remedy than that of placing the broken surfaces of the bone accurately in apposition. It is true, that there is the exception of the "ununited fracture," for which such remedies as friction of the broken surfaces against each other, and, also the mercurial action, have been adopted; but the most impetuous student would scarcely venture on the first, nor the most ardent practitioner adopt the other, without first being quite satisfied that there were extremely good grounds for it.

Bearing, therefore, in mind that the scientific treatment of disease depends on a knowledge of the physiological resources of Nature, in returning to the treatment of Cholera, we will again see if analogy will assist us by the examination of other diseases of the zymotic class.

We learn from the late Dr. Gregory, who, as physician to the Small-pox Hospital during a period of about thirty years gained consummate knowledge

of that disease, some curious and important facts concerning it, namely, that although our acquaintance with small-pox is now so far in a satisfactory state that we are all agreed about its nature and the general principles which should guide us in its treatment, yet this was by no means always the case*. "In the early period of medicine, when pathology was in its infancy and statistics were unknown, physicians arrogated to themselves a power of controlling by drugs the course of diseases, which we now know to be wholly unwarranted. Pages and chapters were devoted to objects quite unattainable, presenting indeed an imposing but a vain parade of learning. In this respect we have improved upon our predecessors.

"It is a melancholy reflection, but too true, that for many hundred years the efforts of physicians were rather exerted to thwart Nature, and to add to the malignancy of the disease than to aid her in her efforts."

It is very generally known that Sydenham, nearly

* Gregory on "Eruptive Fevers."—*Renshaw*, 1843.

two hundred years ago, effected a reform in the treatment of small-pox by substituting a cooling plan for the opposite method, which included closely shut chambers, large fires, thick blankets, and foul linen. With all this undoubted improvement, we are scarcely prepared for the following results:—

These tables are quoted from Dr. Gregory's work.

Table exhibiting the proportion of Severe to Mild Cases, admitted into the Small-pox Hospital in the Years 1837, 1838, 1839, *and* 1840.

Character of the Disorder.	Total in Four Years.	
	Admitted.	Died.
Confluent Cases, ...	637	304
Semi-confluent, ...	267	20
Confluent and Semi-confluent modified, .	143	8
Distinct and varicelloid, ...	373	3
Total, . . .	1420	335

Table exhibiting the comparative mortality of the several varieties of Normal and Abnormal Small-pox, occurring at the Small-pox Hospital, during the Epidemic of 1838, *distinguishing the vaccinated from the unvaccinated.*

Normal Small Pox.	Unprotected.		Vaccinated.	
	Admitted.	Died.	Admitted.	Died.
Confluent, ...	295	149	56	21
Semi-confluent, ...	78	8	42	4
Distinct, ...	19	0	20	0
Total Normal, . . .	392	157	118	25
Confluent modified, . . .	2	0	38	4
Semi-confluent modified, .	1	0	28	1
Varicelloid.	1	0	114	1
Total Abnormal, . .	4	0	180	6
	396	157	298	31

Now, if we are to compare the mortality of small-pox with that of Cholera, we must take the confluent cases alone to compare with cases of collapse in the latter disease, and we see at once that the mortality is certainly not less in small-pox than in Cholera. Dr. Gregory states that, taking the world throughout, the average mortality by small-pox is one in six of those attacked, but the average has never been so favourable as this in the hospital; it has been as high as one in three, and never less than one in five, of all cases.

We must remember too, in this statistical account, that although many of these cases are of the worst description, very many others, as the "distinct and varicelloid," which number 373, or more than half the total number of confluent cases, would never find their way into a hospital at all, but for the peculiar nature of the eruption, which alone, and not constitutional disturbance or illness, convicts them of having the disease, and its notoriously contagious nature is the cause of their admission: such cases of Cholera as would form a fair comparison with these, would never enter a Cholera hospital.

From these facts, we must arrive at the conclusion that it is contrary to experience that the zymotic class of diseases can be altogether exempted from a fatal issue by medical art, although the dangers may be lessened by judicious treatment; and that no specific remedy has ever been discovered for any of them; and that their treatment must rest on a knowledge of their pathology, and on sound therapeutical principles.

Let us then take a concise view of the

Pathology of Cholera.

The blood becoming contaminated by a poison is rendered unfit for its natural purposes of sustaining the vigour of the system, and exerts an influence upon the heart, through the medium of the nervous system, depressing its action. The congestion which is thus induced is immediately attended by a secretion or separation of certain materials from the blood, and, possibly, that which is thus abstracted from it contains some of the poison itself, which is thus gradually eliminated from the system.

The poison, whatever it be, altogether eludes our observation, for the alteration which the blood undergoes, as far as it is obvious to our senses, may be reasonably referred partly to the change of constituents which results from the secretion, and partly to the diminution of the vascular action, which is known to influence the appearance of the blood. A demand is thus created for a supply of fluid which gives rise to an intense thirst, and the instinct of the patient inducing him to drink water very freely, the blood becomes gradually rediluted,

in proportion as the poison is abstracted from the system, by which the freedom of the heart's action is gradually regained. As long as the heart is unable to carry on the circulation with vigour, or in other words until reaction is fully established, the action of vomiting, by mechanical compression of the abdominal muscles, assists the circulation of the blood.

The patient may thus immediately return to health, or the disturbance of the circulation may give rise to local congestions or inflammations in the various viscera.

If this view of the pathology be correct, then the therapeutical principles on which the treatment is to be conducted requires to be considered with great discrimination. It is clear that if a secretion take place to eliminate a poison or relieve a congestion, that there can be no wisdom in immediate efforts to stop it. But is the opposite course wiser? namely, to assist Nature in those efforts by the use of purgatives? Certainly not, that process is best accomplished by Nature's own efforts. I do not believe in the existence of any analogy whatever

between the discharges of Cholera and the colliquative diarrhœa attendant on the last stages of phthisis, or fever, or dysentery, nor do I believe that the remedies which are appropriate in the latter cases are at all so in the former. I am satisfied, from much experience, that cases of epidemic diarrhœa generally speedily subside under the use of the simplest possible remedies which are wholly free from astringent properties; while on the other hand I have often had an opportunity of observing in cases of Cholera that, where astringent remedies of every degree of power were used, from the first occurrence of the symptoms, not the slightest influence whatever was exerted upon the disease.

If we look to other examples of zymotic disease, we shall the more readily understand the source of fallacy to which we are exposed. In scarlet fever, for example, if we carefully looked for the earliest appearance of symptoms, we should find an immense number of cases so free from serious illness that the very large majority would require but little treatment, and that only of the simplest kind, while now and then some cases would occur which would completely baffle all medical skill.

The more we bear in mind the zymotic nature of the disease, and institute comparisons with others of its class rather than with the symptoms which it may present in common with other diseases of a totally different nature, the less liable shall we be to fall into error: thus, the important point is to supply fluid to replace, instead of making futile efforts to stop, that which is unavoidably and irresistibly carried off from the system.

Diarrhœa is to Cholera what eruption is to the exanthemata: it is the index of the disease. In some of the very worst cases there is but little of it, just as there is but little eruption in the worst cases of scarlet fever, so that the collapse attending a profuse diarrhœa is not so fatal as a sudden collapse accompanied by only slight diarrhœa. Still, as a general rule, the severity of the diarrhœa is a measure of the intensity of the disease, just as the extent and confluence of the eruption of small-pox are an index of the severity of that complaint.

The appearance of the evacuation is different according to the severity of the diarrhœa; it passes

through the gradations of fluid resembling dirty water, rice water, spring water, and a peculiar pink fluid, which is only seen when but little else than the colouring matter of the blood remains in the vessels. This last symptom is one from which the Author has rarely witnessed a recovery. The diarrhœa may subside at any period from the date of the attack, and it is chiefly a question as to the state of the circulation how far other symptoms exist or continue. If the features are sunk, the voice whispering, the fingers corrugated, the surface cold and the pulse imperceptible, then the patient cannot recover, according to my experience, unless he be affected with intense thirst, and long continued vomiting. It has been remarked that patients collapsed from this disease are not always thirsty. I have also seen such cases, but they sink—they do not recover: cramps more or less severe will attend a feeble condition of the circulation; yet let no other remedy than friction be used to relieve this symptom; the circulation of the blood cannot but be assisted by their painful pressure on the blood vessels, and the least assistance afforded to the venous system gives hope for continued life. Although mention is made in the former pages of

the value of venesection as described by writers who observed the disease in India, it has only fallen to my lot to witness two cases in which it appeared serviceable in cutting short the disease before collapse. The first case was that of a strongly built man, thirty-five years of age, in the surgical ward of St. James's Infirmary, in 1832, who was attacked with profuse purging, and cramps so violent as to occasion the loudest shrieks within a quarter of an hour of the seizure: he was immediately bled to twenty ounces; had one further characteristic evacuation, and became convalescent the following day. The relief afforded to the cramps was most remarkable; they ceased immediately. The other case was that of a woman, stout and robust, about forty, residing in Berwick Street, in 1848, whose seizure had been very sudden and violent: on our visit she was lying on the floor, where she had fallen apparently from faintness; there was a profuse characteristic diarrhœa. She had great pain and oppression in the region of the heart—the surface was warm; she was freely bled, and experienced a rapid convalescence. In other cases where bleeding was adopted before reaction no benefit was derived. It is extremely difficult to

convey a correct idea of what is to be done for a disease varying so much in intensity, and also in its sequelæ. The perusal of the cases contained in the Appendix may assist the reader in this respect. We may remark that the management of the state of collapse is the most important to study, and we will proceed to its consideration. It may be premised that the effect of such a diarrhœa as is occasioned by active aperient medicine or bilious disorder, when severe, is to occasion thirst, but it is a thirst which is most agreeably allayed by broths or liquid aliment, or cordial drink of some description, at a warm temperature. The thirst, however, which prevails in Cholera where the symptoms are severe and reparative power exists, is so astonishing that it can scarcely be apprehended without being witnessed. Here, the patient is disgusted at the slightest admixture of alimentary material with his drink, which must be water, and the temperature cold;—wine, brandy, even toast pollutes it, to his fancy. The surface of the body is cold, but a sensation of heat pervades the whole frame: the blood vessels must be replenished with a fluid less noxious than that which the heart has been incapable of circulating, and which has con-

sequently been thus thrown off from the system, mysteriously unfitted for use. Where reparative power exists, ice may be added to the water for drink, which adds to the comfort of the patient, the palms of the hands may be rubbed with ice, and cold wet cloths may be applied to the surface generally, in proportion as it affords relief, the body being carefully covered up to prevent evaporation; thirst is thus somewhat allayed, and the nervous system soothed. The feelings of the patient, with reference to the management of temperature, must be our only guide.

There is a sinking form of Cholera, indeed, in which, although the collapse is intense, there is no relief afforded by any measure; there is but little diarrhœa, vomiting, cramp, or thirst, and the patient feels chilly.

The use of cold is of course not required here; it applies only to that condition in which the patient himself complains of a sense of heat felt throughout the body, while the surface is really quite cold. The judicious management of materia medica consists chiefly in abstaining from the

employment of injurious remedies, but while we select a mild aromatic or an innocuous saline medicine, let us refrain from such sarcasm upon the credulity of human nature as is conveyed in the prescription of the globule. Opium is perhaps of all the most carefully to be avoided, as one of the chief dangers to be feared during reaction is congestion of the brain. The slightest delirium, an incoherent word uttered is here to be regarded with the greatest apprehension: a moderate head ache affords sufficient reason for the use of gentle mercurial action; a grain of calomel and three of antimonial powder should at once be given and continued every third hour, and a fold of linen kept wetted with a flake of ice, should be constantly applied until every uneasy sensation about the head is entirely dissipated. The necessity for the abstraction of blood must also be watched, and at once adopted, if the means above mentioned are not followed by a satisfactory subsidence of the symptoms. When a patient has been in a state of collapse for a period of two or three days, and then undergoes reaction, it is necessary to examine all the viscera with the greatest care to detect the earliest existence of congestion. If the nights

should be cold, attention must be especially directed to the state of the lungs; the existence of crepitation, or of dulness, in the inferior lobes must be ascertained; cough, expectoration, and dyspnœa assiduously watched, and when symptoms commence, warm poultices, containing a fourth of mustard and of large size should be applied over the whole back of the chest below the shoulder-blades, extending over the ribs to the front of the chest. These are of the greatest service, nor, if the pulse at all admits of it, need any fear be entertained of the abstraction of blood, which, while it is of darker colour than natural, will often be found to exhibit the buffy coat.

The abdominal viscera should also be examined with the same attention, and the mercurial action and leeches, or venesection be resorted to, according to the necessity of the case. The cases under my observation in 1832 were more remarkable for congestion and fever than those which I have seen subsequently, and it was then sometimes necessary to bleed a patient as often as four times, besides having recourse to the free use of leeches, before his convalescence became established. It is abso-

lutely necessary to forbid the use of any particle of solid food until convalescence is fully declared. A colliquative feculent diarrhœa also sometimes supervenes during or after reaction: this of course requires to be restrained by the use of astringents.

In the former edition, I avoided introducing the details of cases which showed strong tendencies to congestion and inflammation, because I was unwilling to distract attention from the method by which nature brought about reaction from the state of collapse. In some of the cases that were under my care in the epidemic of 1832 the dangers were nearly as great from the sequelæ as from the collapse itself.

The perusal of these cases will show that local congestion and inflammation, not *specific* fever, were the real pathological conditions; and it cannot be uninteresting to observe that so fertile are the resources of the animal economy as to completely baffle all calculation of its powers; for we here see that the system being drained to the last extremity of its fluids, although replenished with the simplest diluents, still bears almost un-

exampled abstractions of blood, not only without occasioning symptoms of dangerous depression or of anæmia, but without preventing a rapid and complete convalescence.

The subject of vomiting is so important a consideration in Cholera, that I venture to reprint my paper from the "Medical Gazette," as containing more completely the arguments respecting it than can easily be introduced into this volume in any other way. I have only to add concerning this symptom that wherever I observe that it is proceeding with energy, accompanied with a cessation of diarrhœa for some hours, I at once feel relieved of all apprehension of a dangerous result.

ON VOMITING, AS ANTAGONISTIC TO SYNCOPE;

WITH REMARKS ON CHOLERA.

By J. G. FRENCH,

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From the "London Medical Gazette," 10th August, 1849.

Vomiting is a symptom so familiar to every medical practitioner as associated with severe and often irremediable lesions, and is in itself so distressing, that the physician who witnesses it is more inclined to endeavour to alleviate it than to speculate on its physiological bearings. To enter at large on the subject of vomiting would be to engage in a work of great extent; it is my purpose, therefore, simply to prove by these observations, that in one point of view vomiting may be regarded

simply as antagonistic to syncope. I will venture to make the general proposition, that any cause capable of so lowering the force of the circulation as to determine syncope can also produce vomiting. If a strong man lose blood to such an extent as to induce syncope, he will, in all probability, have a seizure of vomiting. Should this occur during incipient fainting, he will not swoon; if he has completely swooned, we may calculate on reaction on the occurrence of evomition. Thus, then, from so direct a source of enfeebled circulation as the sudden abstraction of blood from a healthy man whose stomach or system contains nothing deleterious, we may confidently rely upon the production of vomiting. The phenomenon of sea-sickness, in my opinion, consists simply of a series of attacks of syncope, followed by a series of reactions. The fact that fainting is produced by a swinging motion on the generality of individuals, is undoubted, and the relief afforded to that condition by the full and active efforts of retching, is also equally certain; but as the agitation of the ship continues, these phenomena continue to hold their alternate course until either the rocking of the vessel is discontinued, or the system ceases to be affected by it.

It is highly probable that the class of emetics and also some poisons owe their emetic effects simply to their influence in depressing the heart's action, and not to any direct effect upon the stomach itself. So, if any severe shock has been sustained by mechanical injury, when vomiting occurs it is to be regarded as evidence of reaction from a state of more or less syncope which has resulted from it.

If we study the physiognomy of a person in a state of syncope, and also during evomition, we find that the two conditions are exactly opposite: in fainting the countenance is completely blanched; while in evomition the capillaries are intensely injected, even to those of the conjunctivæ.

Whatever may be the powerful effects of medicines in curing insidious diseases, in syncope they are peculiarly inert compared with the immediate influence of measures suggested by the physical laws. Thus the horizontal posture is by far more restorative than any of the articles of the Materia Medica. In examining the mechanism of energetic vomiting, we have only to regard the powerful

contractions of the diaphragm and abdominal muscles, in order to understand its effect on the circulation; direct pressure on elastic tubes containing a viscid fluid being obviously the most immediate way of emptying them. Nor should it be forgotten that the blood varies in the degree of its fluidity in proportion to the force of the circulation: thus rendering mechanical action the more important when the circulation is feeble.

I am unwilling to leave the subject without adding a few words on its application to Cholera.

In the state of collapse, with the heart scarcely acting at all, and the blood in a peculiarly viscid condition, what measures can be so restorative of the circulation as the action of vomiting? It is a fact connected with the history of the disease, that when this symptom is the most remarkable, the disease is least fatal. It is not to be alleged against the medical profession, that deficiency of zeal or inactivity are the causes to which the want of success in the treatment of this disease is to be ascribed, and therefore, if it be established that the act of vomiting is desirable in Cholera, it

becomes important to weigh well how far this doctrine is to influence the remedial art. If vomiting, after shock, produce reaction—if it relieve the syncopal condition of sea-sickness—if it be observed quickly to restore the circulation in the subject of hæmorrhage, surely these are circumstances in which the use of emetics would never, for a moment, be proposed. It has even been already suggested that many of the substances which produce this effect do so only by lowering the force of the circulation: thus exciting vomiting as the act of the so-called vis medicatrix naturæ.

The indiscriminate use of emetics, then, in the treatment of Cholera, is not to be regarded as desirable, for this reason :—all reparative processes presuppose vital power to establish them. If, therefore, there be no vomiting, it is a proof of want of vital power to resist the influence of the disease—just as in a fatal syncope there may be no emesis—and that such an action may be there even unattainable.

The object of this paper is, indeed, only to treat of the principle on which vomiting is directly beneficial in those states of the system in which

circulation is arrested, or is preternaturally feeble: the chief difficulties of the circulation are with the venous system, whose current is derived from the vis à tergo. If there be no vis à tergo to carry forward the stream, then direct pressure on the vessels is obviously the quickest way in which this can be accomplished; and where this action from vomiting is going on with energy, the circulation is likely to be restored in the quickest and most satisfactory manner consistent with the nature of things. It is true that in some of those apparently helpless cases of collapse observed in Cholera, vomiting is continued for a period of seventy-two or even eighty hours before the circulation is fairly established; but the fears of those who regard vomiting as a dangerous symptom of itself, when associated with a depressed state of the circulation, are proved to be without foundation by the general experience relating to sea-sickness.

Although I am persuaded that in the class of emetics remedies are not to be always sought for bringing about the vomiting, which I assume to be one of those remedial efforts of Nature which are observed to follow injuries of all kinds where vital power exists, yet I do not doubt that this action

may occasionally be determined by other means with advantage. Indeed, I am inclined to believe that, if stimulants are ever serviceable at all in acute cholera, it is simply by determining the action of vomiting, by which their expulsion is ensured, and not by their absorption into the system. In severe collapse, associated with energetic vomiting, will be observed a vehement thirst, with a strong desire and preference for cold water. If this fluid be freely taken it becomes gradually absorbed, as the baneful influence of the disease wears off, restores the fluidity and the volume of the blood, and thus renders the circulation of that fluid less dependent on the severe compression of the diaphragmatic and abdominal muscles*.

It is frequently remarked that nothing is known of the nature of cholera; and it is alleged as a

* The argument with reference to muscular pressure applies, of course, to the cramps of the extremities: these are commonly referred to abdominal irritation; but, as precisely the same phenomenon occurs in cases of hæmorrhage, where there is a deficiency of the vis à tergo, and where no abdominal irritation is even suspected, I think it more philosophical to refer them to the same source—viz., to the vis medicatrix naturæ.

ground for this assertion that its mortality is great, and but little modified under every conceivable variety of treatment. It should, however, be borne in mind, that the reason why other diseases are not so fatal is, not because we are better informed of their nature and treatment, but because they are less severe. Death, at least, wears no mask in his approach in the form of Cholera.

It is, at all events, obvious that the heart itself is not performing its functions properly, and that the failure of the circulation constitutes the danger of the malady. It is commonly believed that this state of the circulation is owing to the diarrhœa which attends it, and when death supervenes before the occurrence of diarrhœa, it is said that the alimentary canal already contains the excreted fluid, and that the effect is the same on the circulation as in the case of internal hæmorrhage. But whence does the diarrhœa arise? It has been gravely asserted to proceed from the use of unripe plums, and articles of diet of all kinds reputed to be indigestible; but as experience has clearly shown that it attacks persons who never partake of these things, and that its victims are selected with

the same indiscrimination which is remarked in other epidemics, this ground has been to some extent abandoned.

Although the functions of the alimentary canal are so violently disturbed, if we look to it for an explanation of the phenomena of Cholera we find the question beset with difficulties. In cases of the worst kind which are short of proving fatal, convalescence is not only commonly too speedy to be consistent with any serious lesion* of the alimentary tube; but it is not even the structure from which most danger is to be apprehended; head symptoms decidedly taking precedence in this respect.

* A new light is supposed to be thrown on the nature of the disease by microscopic observation—viz., that the epithelium of the digestive canal is thrown off. This may well be expected as a mechanical result of the inordinate derivation from the bowels, and may afford an excellent reason for care in diet during convalescence; but it is no argument in favour of the idiopathic affection of the bowels. The epithelium of the urinary tubuli is thrown off in scarlet fever, but nobody surmises that scarlet fever is an idiopathic disease of the kidney.

If, however, we look to the heart itself as the organ, the function of which is primarily impaired, we find an explanation of all the phenomena.

No one regards small-pox or scarlet fever as diseases of the skin, but as some internal disorder which is beneficially eliminated on the surface, and these eruptions are more or less severe according to the severity with which the vital organs are threatened. It is, indeed, a fact, that but for the appearance of cutaneous phenomena the existence of these diseases would pass unobserved in many cases, so slight is the constitutional disturbance. No reason has, however, yet been suggested why a pustule occurs in the one case and an efflorescent rash in the other; but it is easy to explain why an irruption of fluid should proceed from the vessels into the alimentary canal if the power of the heart be diminished, because that is consistent with all that is known and observed in physiology: secretion ever attends congestion—that is, if the congestion be relieved; and it is by this process that the remarkable degree of relief which is afforded by elaterium, in certain structural diseases of the heart, is to be explained.

I have in former papers attempted to show the analogy between the effects of digitalis (which is generally admitted to possess the power of paralysing the heart's action) and those of Cholera—namely, that its moderate effects are evinced by diuresis, while recovery from a poisonous dose is attended with profuse watery purging, incessant vomiting, cramps, cold clammy sweats, and suppression of the urine for three days.

It may be here remarked that some observers record the fact that diabetes was observed to be common among the attendants of cholera hospitals.

In conclusion, I would observe that, whatever view be taken of the nature of the disease, and whatever cause be assigned for the state of collapse, the treatment of that state on just physiological principles demands redilution of the blood with cold water, and that the cramps and vomiting should be regarded as directly tending to restore the circulation.

APPENDIX.

THE opinions detailed in this volume were formed from data afforded principally by the cases which occurred in St. James's Cholera Hospital in 1832; of which the results are stated in the following table. The cases are arranged according to the age of the patients, which it will be perceived had a remarkable effect on the result.

The cases are not less valuable because the Author had not any theory whatever to guide him in the treatment, at the time they were entered in the journal of the hospital. Subsequent observations and experience have convinced him of the truth of what he has advanced.

Recovered.	*Age.*
1. George Hardwick	6
2. Sarah Harrison	7
3. Margaret Lidgate	9
4. Eliza Coy	10
5. Henry Mac Carty	17
6. Ann Coffee	21
7. Daniel Caulwell	22
8. Isaac Shed	24
9. John Chandler	25
10. Eliza Thompson	26
11. William Chalkwright	30
12. Charles Standing	30
13. Sarah Thompson	35
14. Mary Harrison	36
15. Louis Jacomo	39
16. Ann Pollock	40
17. Ellen Ellis	50
18. John Poole	50
19. Mary Drew	66

Died.	*Age.*
20. William Dixon	77
21. Mary Priest (8th day)	76
22. Eliza Sherridan (8th day)	75
23. Mary Mills	72
24. William Price	72
25. Mary Evans	70
26. Mary Drake	68
27. William Aimley	67
28. Martha Stubbleday	59
29. Mary Jenkins (6 hours)	56
30. Rachel Wood (8th day)	55
31. Edward Barron (4th day)	52
32. Ellen Ross (6 hours)	41
33. Eliza Bell (7th day)	33
35. Margaret Gardiner (8th day)	29

CASES OF CHOLERA TREATED

IN THE ST. JAMES'S CHOLERA HOSPITAL.

1.—George Hardwick, ætat. 6 years, was attacked on the morning of the 21st of July, 1832, with purging and vomiting. He was admitted into the Cholera Hospital at one, p.m., and his symptoms then were—

1, p.m. Collapse, skin cold, pulse imperceptible, purging and vomiting of a watery fluid.

Ordered—Cataplasm. sinap. spinæ et
Scrobiculo cordis,
℞. Hyd. Subm. gr. v.
Sacchari. gr. vi.
Ft. pulvis statim et 2dis horis sumend.
Cold water *ad libitum*.

6, p.m. Vomiting and purging abated. Has had several attacks of cramp. Skin is now warmer, and the pulse perceptible.

11, p.m. Skin is warm. Purging and vomiting have not returned since last visit.

July 22.—7, a.m. Has vomited a small quantity of rice water fluid during the night. The pulse is good and the skin warm.

12, Noon. Has passed a motion of a colourless appearance.

3, p.m. Grinding of the teeth. Insensibility. Slight delirium.

Ordered—Hirud. iv. parv. temporibus.

July 23.—9, a.m. Tongue moist. The head symptoms

have subsided. Appetite has returned. Passed a green-coloured motion in the night.

July 24.—10, a.m. There have been some green bilious motions. Passes urine in small quantities. Tongue is moist. Skin warm. Appetite not quite so good.

℞. Hyd. Subm. gr. j.
Pulv. Antim. gr. j. m. fiat pulv. ter quotidie sumend.
℞. Liq. Ammon. acet. ʒi.
Mist. Camphor. ʒv. m. fiat
Mist. cujus capiat cochl. duo 4tis horis.

July 25.—Tongue somewhat dry. Motions still green. Urine more plentiful. Appetite not much improved.

July 26.—Better in every respect.

July 27.—Continues to improve.

July 28.—Convalescent.

2.—Sarah Harrison, ætat. 7 years, of previous good health, was attacked September 2, 1832, at 8, a.m., with purging and vomiting. Admitted at 2, p.m.

Sept. 2.—2, p.m. Surface of trunk and superior extremities warm. Lower extremities cold. Pulse imperceptible at the wrist. Eyes sunk in the orbits. Countenance anxious. Since admission has had no purging, but has vomited considerably. The colour of the fluid ejected being at first green, but now white. Great thirst. She asks for cold water.

Ordered—Catap. sinap. spinæ et scrob. cordis.
Hot water bottles to the feet.
Cold water *ad libitum.*

8, p.m. Pulse distinct at the wrist. The whole surface of the body is warm. Has not been purged. Has drank a great quantity of cold water, part of which has been returned by vomiting, but not nearly to the extent taken.

Sept. 3.—10, a.m. Reaction completely established. Has passed some urine. Bowels opened naturally.

To have mutton broth.

10, p.m. Has been going on very well. Has taken a little arrow-root.

Sept. 4.—Left the hospital quite recovered.

3.—Margaret Lidgate, ætat. 9, was admitted from the Burlington School on the 8th of July, at one, p.m., labouring under the following symptoms:—

Vomiting and purging of rice water evacuations. Skin below the natural temperature. Eyes sunk deeply in their sockets. Tongue furred. Pulse nearly imperceptible. Thirst excessive, voice whispering, and occasionally shrieking. Considerable jactitation. Cramps in the extremities. The patient continually expressing her urgent desire for cold water.

Mustard poultices to the spine, and pit of stomach,
Saline mixture.
Hydrargyri submuriatis gr. ij., fiat pulvis omni hora sumendus.
To drink cold water *ad libitum*.

3, p.m. Vomiting and purging not so violent.

9, p.m. Symptoms continuing without increase. Pulse occasionally imperceptible.

July 9.—1, a.m. Lower extremities and trunk warm. The upper extremities and face continuing cold and clammy.

9, a.m. Has had some sleep. Vomiting continues. Purging has ceased. The hands becoming blue and shrunk. Lower extremities warm. Pulse at the wrist imperceptible.

9, p.m. Skin warmer. Pulse can now be felt. Countenance improved. Vomiting continues, contains green bile. Has passed a bilious motion. Sleeps occasionally.

July 10.—9, a.m, Heat of forehead. Grinding of the teeth. Occasional delirium.

Ordered—Hirudines iv. temporibus apponendæ.

9, p.m. Pulse 98. More sensible.

July 11.—9, a.m. Tongue covered with brown fur. Pulse 96. Has passed a bilious motion, with which probably there is some urine, otherwise has passed none since the commencement of her disorder. Skin cool.

Ordered—A little wine and arrow-root occasionally.

9, p.m. Some improvement. Has passed a small quantity of urine.

July 13.—9, a.m. Tongue very red and moist. Considerable disposition to sighing. Has slept a good deal at intervals during the night. Pulse 94.

Ordered—Beef tea with arrow-root.

July 14.—Convalescent, but still weak to a considerable degree.

July 17.—Left the hospital recovered.

4.—Elizabeth Coy, ætat. 10 years, whose health previously had been somewhat delicate. Was attacked on the 10th of July, 1832, with purging, vomiting, and cramps.

She was admitted into the hospital at 7, a.m.

July 10.—7, a.m. Purging and vomiting of a rice water appearance. Cramps in the legs and hands. Pulse nearly imperceptible. Eyes deeply sunken. Skin, tongue and breath very cold. Voice low. Great thirst.

Ordered—Mist. salinæ ℥ i. pro re natâ.
Water *ad libitum.*
Catapl. sinap. scrob. cordis et spinæ.
Hot bottles to the feet.

2, p.m. Skin not so cold. Thirst less. Vomiting and purging not so frequent.

5, p.m. Occasional cramps in the legs. Skin warm.

10, p.m. Shows a disposition to sleep. Pulse 150.

July 11.—9, a.m. Countenance improved. Tongue moist, covered with a light brown fur. Pulse 146.

Ordered—A little wine and arrow-root.

9, p.m. Pulse 130. Has passed a small quantity of urine. She has lost the whispering voice with which she has hitherto spoken.

July 12.—9, a.m. Has vomited some fluid containing green bile. The motions also are of this character. She rejects the wine. Tongue moist with less fur. Pulse 130.

Ordered—Beef tea with bread.

July 13.—Health improving.

July 14.—Convalescent.

July 17.—Quite well. Left the hospital.

5.—Henry M'Carthy, ætat. 17, of previous good health and habits, was attacked on the morning of the 25th of July, 1832, with purging and vomiting. The evening before this he had not felt well, and was troubled with severe cramps. Admitted into the hospital at 3, p.m.

July 25.—3, p.m. Has been purging and vomiting all the morning, and has also had severe cramps. His skin is now warm. Pulse 80. Complains of pain in the umbilical region of the belly.

Ordered—Hot fomentations to the belly.
Hyd. subm. gr. vi.
Opii. Pulv. gr. i. m. fiat pulvis statim sumend.

10, p.m. Only one motion has passed, solid, and of a pale colour, together with a great deal of watery fluid. The uneasiness in the bowels is now more diffused extending to the chest. Skin warm. Pulse 80. The eyes before full, now begin to show depression.

Ordered—Venæsectio ad ℥ vi.
Mist. salinæ ℥ i. 2dis horis.

July 26.—Has passed two or three pale motions. Tongue clean. Pulse 100. Countenance improved. Has passed a little urine.

July 27.—Convalescent.

6.—Anne Coffee, ætat. 21. Previous health and habits good. Was attacked July 15, 4, p.m., with purging and cramps. Admitted into the hospital at 10, a.m.

July 16.—10, a.m. Skin cold. Countenance pinched and anxious. Pulse weak. Vomiting. Thirst. Cramps in the feet. No urine passed.

Ordered—Catapl. sinap. scrob. cord.

12, noon. Cramps in the hands.

5. p.m. Has slept. Skin warm and moist. Has not been purged. Complains of headache.

Ordered—Evaporating lotion to the head.

11, p.m. Has passed two bilious motions.

July 17, 9, a.m.—Has passed a considerable quantity of urine, and had a motion. Pulse 84. Has some appetite.

July 18.—Convalescent.

July 19.—Quitted the hospital.

7.—Daniel Caulwell, ætat. 22 years. Was attacked August 6, 1832, at 9, a.m.. with purging, followed by vomiting and cramps. Admitted into the hospital at 10, p.m.

August 6, 10, p.m.—Countenance much emaciated. Eyes deeply sunken with dark areolæ around them. Skin cold. Voice whispering. Pulse almost imperceptible. Has been vomiting a dark fluid copiously. Rice water purging very frequent. Considerable thirst.

Ordered—Catap. Sinap.
Hot bottles to the feet.
Mist. salina.
Hyd. sub. ℈i. 2dis horis sumend.
Cold water *ad libitum*.

August 7, 7, a.m.—Some improvement in every respect.

2, p.m. Considerable vomiting of a white fluid. Voice weaker. Pulse 109. Very feeble.

9, p.m. Less vomiting. Complains of hiccough.

August 8, 9, a.m.—Has passed a pretty good night, and is better. Has had a green coloured motion.

August 9.—Vomiting of a green fluid. Pulse full, and somewhat hard. Some degree of stupor.

Venæsectio ad ℥ viij.

August 10.—Head symptoms much relieved. Has passed a bilious motion.

August 11.—Continues to improve. Has some appetite.

August 12.—Convalescent.

August 13.—Quitted the hospital.

8. Isaac Shed, ætat. 24, a tailor, whose previous health had been good, and habits regular, was attacked August 28, early in the morning, with bilious vomiting and purging. He had suffered from diarrhœa for eight days previously. He was admitted into the hospital at 2, p.m.

August 28, 2, p.m.—Vomits green bile. Skin warm. Countenance much emaciated. Has been purged most violently, but not within the last hour.

Ordered—Warm diluents.

10, p.m. Pulse full and hard. Skin very warm.

Venæsectio ad ℥ xiv.
Hyd. subm. gr. x.
Confect. q. s. in pilulas iii. horâ somni sumend.

August 29, 10, a.m.—Sickness diminished. Has passed a motion tinged with healthy bile.

10, p.m. Pain in the head of a dull character. Pulse somewhat hard.

Venæsectio ad ℥ ix.
Hyd. subm. gr. ii.
Pulv. Antim. gr. ii. 4tis horis sumend.

11-30, p.m. The blood drawn presents no marks of an inflammatory character. No urine secreted. Pain in the head relieved. Pulse softer.

℞. Sodæ Mur.
—— Carb.
Potass. Nitrat. āā. ʒ ss.
Mist. Camph. ℥ vj. m.
Sumat. ʒ j. 4tis horis.

August 30.—10 a.m. Passed a better night. Pulse 98 full. Tongue rather dry. Bowels opened. Thinks he made water during the night.

Pergat in usu medicinæ.

August 31.—9, a.m. Very restless during the night. Complains of a dull weight across the forehead.

To have his hair cut off.

1, p.m. Feels his head relieved since the hair was removed, but there appears great inclination to stupor. Urine secreted.

℞. Vin. Ipecac. ℥ ss.
Liq. Ammon. Acet. ℥ iss.
Mist. Camph. ℥ vj. m.
Sumat ℥ iss. 4tis horis.
App. Hirudines viii. temporibus.
Rep. Pulv.
Venæsectio ad ℥ iv.

11-30, p.m. The blood drawn is cupped and buffed. His head is a little relieved. He is vomiting a fluid containing green bile.

Capiat Pulv. 2dis horis.

Sept. 1.—10, a.m. Had no sleep last night. Complains of no pain, but the weight in the head still continues. His bowels are much relaxed. His motions green and of more consistency. Urine secreted freely. Pulse 88, full. Tongue brown, but not so dry. Mouth not sore. Nausea.

Omitte Pulv.
Rept. Mist.
℞. Ung. Hyd. Fort. ℥ i. Hujus ung. affricetur ʒ i. femoribus inter. 2dis horis donec ptyalismus cieatur.
App. hirud. viij. temporibus.

10-30, p.m. His head is relieved, but he seems depressed.

Sept. 2.—9, a.m. Much the same. His gums are not yet affected.

10, p.m. A slight return of uneasiness about the head. Inclination to stupor.

Venæsectio ad ℥ iv.

Sept. 3.—10, a.m. The stupor has quite left him. The blood drawn presents a remarkably cupped and buffed appearance. Pain and tenderness over the liver. Pulse 78. Full and rather hard. Tongue brown but moist. Mouth not yet affected. Bowels open.

Venæsectio ad ℥ vi.
℞. Hyd. subm. gr. i.
Pulv. Ipecac. gr. ss.
Confect. q. s. m. fiat pil. 3tiis horis sumenda.
Rept. Mist.
App. Emp. Lyttæ hypoch. dext.
Beef tea.

Sept. 4.—10, a.m. Passed a better night. Pain relieved. Tongue moist. Mouth becoming affected. Some hardness of the pulse.

Venæsectio ad ℥ iv.
Pergat in usu medicinæ.
Mutton broth.
A little wine to be given.

Sept. 5.—10, a.m. Free from pain. Tongue dry. Thirst.

To omit the wine.

Sept. 6.—9, a.m. Pain in left hypochondrium increased on pressure.

App. hirudines xii. lat. sinistro.
Fotus.
Emp. Lyttæ.

10, p.m. Pain not much relieved.

Sept. 7.—In much the same state.

Sept. 8.—10, a.m. Slight return of uneasiness in the head. Eyes heavy. Tongue dry.

App. hirud. viii. temporibus.

11, p.m. Still complains of his head. His gums are slightly affected.

Sept. 9.—Symptoms relieved.

Sept. 10.—Slept better. Dizziness in the head. Gums sore. Considerable weakness.

Omitte pil. et mist.
Take wine and broth.

Sept. 12.—Improving slowly.

Sept. 15.—Going on very well.

Sept. 18.—Quitted the hospital.

9.—John Chandler, aged 25, attacked 17th of July, 1832, at 11, a.m., with vomiting, purging, fainting and

cramps. Previous health good. Had diarrhœa for a few days before. At 9, p.m. Complete state of collapse, vomiting and purging have been very copious. The purging continues of rice water evacuations. Considerable thirst. Pulse imperceptible.

Cold water *ad libitum*.
Mustard cataplasms to spine and pit of stomach.

July 18.—3, a.m. Delirium. Some degree of warmth about the surface.

Venæsection to 8 ounces.

9, a.m. Somewhat better. Mind sensible.
3, p.m. Has passed a pale bilious motion.

Calomel, gr. iv. in pilula hora somni.

9, p.m. Surface generally warm, except the hands.

July 19.—6, a.m. Has slept during the night three or four hours. Has passed no water. Pulse somewhat firmer.

Broth, barley-water, *ad libitum*.

12, noon. Vomits occasionally a small quantity of fluid, mixed with bile of a green colour.

11, p. m. Has passed a small quantity of urine.

July 20.—7, a.m. Has slept pretty well. Passed six ounces of urine during the night. Bowels have not acted since yesterday.

Diet as before.
Haust. aperiens.

10, p.m. Has had three bilious motions. Heat restored, except to the tips of fingers.

July 21.—10, a.m. Continues to improve. Sleeps a good deal.

July 22.—Continues the same.

July 23.—9, a.m. Pain at the left side increased on deep inspiration. The nose has bled during the night.

Venæsection to 18 ounces.
Blister to the side.
℞. Calomel.
Pulv. Ant. āā. gr. ii. 4tis horis,
Liq. Am. Ac. ʒ iss.
M. Camph. ad ʒ viii.
Potass. Nit. ʒ ss. fiat Mistura.
Capiat. Coch. Ampla. iii. 4tis horis.

5, p.m. Blood much buffed and cupped. Tongue dry. Bowels have not acted to-day. Has passed but little urine to-day, attended with pain.

Olei Ricini ʒ ss. mane.

2, p.m. Pulse hard, and the pain in the left side not quite relieved.

Venesection to 20 ounces.
25 leeches to the side. Blister removed to apply leeches. Hot fomentations afterwards, and blister to be re-applied.
Hyd. Chloridi gr. i.
Pulv. Ant. gr. ii. in pilulam ter die sumendam.

July 25.—9, a.m. The pain much relieved, but not quite lost. Tongue dry, red. Appetite bad. Has passed rather more urine. Blood drawn yesterday much buffed and cupped.

July 25.—Noon. Pain almost gone, can breathe without producing pain. Bowels have acted. Tongue is dry and glossy. No stupor. Sleeps a good deal.

July 26.—9, a.m. Has passed a good night. Bowels act frequently. Small quantities of dark feculent matter evacuated without pain.

July 27.—Better in every respect.

July 28.—Convalescent. Left the hospital.

10.—Eliza Thompson, ætat. 26, had been purged for several days before admission into the hospital on the 5th August, 1832, at 11, a.m.

August 5th.—11, a.m. Countenance sunken. Skin warm. Pulse about 80, and very feeble. Tongue furred.

℞. Hyd. Subm. gr. v.
Opii Pulv. gr. i.
Confect. q. s. ft. pilula statim sumenda.

12, noon. Has passed a small bilious motion, and has vomited considerable quantities of bilious fluid.

Warm mucilaginous drinks.

5, p.m. The vomiting continues, bilious and abundant—the purging is inconsiderable.

℞. Hyd. Sub. gr. iij.
Pulv. Antim. gr. ij.
Opii Pulv. gr. ¼.
Confect. q.s. m.
Divide in pil. ij. 2dis horis sumendas.

8, p.m. Disposition to sleep. Vomiting lessened. Pulse 96.

August 6th. Has passed a tolerable night.—6, a.m. Vomiting diminished, but still considerable. Has been purged but once during the night.

Pulveres effervescentes. Sumat unum 4tis horis.
Rep. Pilulæ Hyd. Subm.
App. Emp. Lyttæ scrobic. cordis.

10, p.m. Improved. Vomiting is lessened.

August 7.—7, a.m. Passed a good night. Bowels have acted slightly.

9, p.m. Sleeps a good deal. Vomiting has ceased.

August 8.—Much improved.

August 12.—Quitted the hospital.

11.—William Chalkwright, ætat. 30, August 31, 1832, attacked 2, a.m. Vomiting—purging—cramps—usual health good, and habits regular. Diarrhœa for three days previously.

11, a.m. Surface of body cold. Pulse nearly imperceptible. Vomiting. Has been very much purged. Eyes very much sunk, with dark areolæ round them. Cramps. Countenance anxious. Thirst.

Sinapisms to the spine and abdomen.
Hot water bottles to feet.
Cold water for drink.

1, p.m. Surface of body warm. Pulse 92, soft and full. Cramps very severe in the extremities. Has had no evacuation from the bowels since admission into the hospital. Sickness abated. Thirst not decreased. Feels an inclination for sleep.

5, p.m. Has had two or three rice-water dejections. Cramps not relieved.

Pulv. Ipec. ℈i. pro haust. emetico.

11-½ p.m. The purging still continues. A mustard emetic was also given, since which he has had but one motion of the same character as before. Cramps not quite so frequent. Complains of slight uneasiness across the forehead. Pulse full and quick.

Venæsectio ad. ℥ xij.

Blood flowed freely, and with considerable force.

September 1.—10, a.m. Has had a very good night. Bowels less relaxed. Motions rather improved. Sickness continues. Cramp less severe. Pulse 120, small and compressible. Tongue pale and moist. Less anxiety of countenance.

½ past 10, p.m. Has passed a pint of highly coloured urine.

September 2.—Much better this morning.

Mutton broth.

September 3.—Improving. Passed a good night. Pulse 84—full. Tongue clean and moist. Bowels open. Urine natural in quantity—rather high coloured. Thirst continues. Appetite pretty good.

℞. Potass. Supertart. ʒ ij.
Potass. Nit. ϑ i.
Aquæ puræ ℥ viij. pro potu.
Beef tea.

4.—Slept well. Complains of pain at the Hypogastrium.

Hot fomentations.

8, p.m. Bowels have not acted since yesterday.

Haust. aperiens.

½ past 11, p.m. Pain much increased. Pulse full and hard.

Venæsectio ad ℥ xiv.

September 5.—8, a.m. Passed a restless night.

11, a.m. Pulse about 80—full and rather hard. Pain as bad as ever. Complains of pain on the left side when he moves.

Venæsectio ad ℥ vj.
Hirudines xx.
Emp. Canth. postea.

10, p.m. Bowels have acted once. Pain still continues.

6th.—9, a.m. Pulse hard. Skin hot and dry.

Venæsectio ad ℥ xx.
℞. Liq. Ant. Tart.
Vini Ipecacuanhæ āā ʒ ij.
Misturæ Camphoræ ad ℥ viij.
Potassæ Nitratis ʒ ss.
Fiat Mist. capiat coch. ampla tria 4tis horis.

℞. Hyd. Chloridi.
Pulveris Antim. āā gr. j.
Ft. pilula 4tis horis sumenda.

6, p.m. The bleeding has afforded relief—blood much cupped and buffed. Pain in left hypogastrium—increased on pressure. Pulse soft.

9, p.m. Pain as bad as it was this morning, although the pulse is softer.

App. hirudines xij lateri.
Hot fomentations.

7th.—10, a.m. Better. Pain not quite gone, but considerably relieved.

Pergat in usu medicinæ.

8th.—10, a.m. Says he is much better—quite free from pain. Tongue moist. Bowels open—still some degree of hardness about the pulse.

9th.—Convalescence confirmed. Leaves the hospital today.

12.—Charles Standing, ætat. 30, was attacked on the morning of August 21st, 1832, with purging, succeeded by vomiting and cramps. Except that for two or three days previously, he had had bilious vomiting and purging, his general health was good.

Admitted into the hospital at 10, p.m.

August 21.—10, p.m. He is now purging and vomiting a fluid resembling rice water. He has cramps in the extremities. Pulse small and frequent. Countenance anxious. Eyes sunken. Complains greatly of intense thirst.

Ordered—Catap. Sinap. spinæ et abdom.
Hot water bottles to feet.
Cold water to drink.

1-30, p.m. Greatly cramped. Purging and vomiting continue, surface of the body is warm.

August 22.—9, a.m. Says that he feels much better. Vomited some blood during the night. Still has cramps, but less severely. Countenance improved. Thinks the water agrees with him better than tea.

August 23.—9, a.m. Did not pass a good night Vomiting continues. Stools slightly tinged with bile. Anxiety of countenance.

4, p.m. Is not able to keep anything on his stomach for any length of time. Drinks much cold water, which he prefers to anything else.

11-30, p.m. Symptoms of oppression about the chest.

Venæsectio ad ℥vj.

August 24.—10, a.m. Vomiting continues, but less frequently. Colour of the bile more natural. Motions improved. The blood drawn last night much buffed and cupped. Pulse small, but tolerably firm, about 96. Countenance improved, respiration more free.

August 25.—10, a.m. Complains of uneasiness again, about his chest. Secretion of urine restored.

Venæsectio ad ℥iv.

12, p.m. His chest has been relieved by the bleeding. The blood was somewhat buffed.

August 26.—Feels much better. The vomiting has subsided. Free secretion of urine. There is still some sense of weight at the lower part of his chest.

8, p m. Tenderness on pressure at the epigastrium.

Fotus.

Emp. Lyttæ scrobic. cordis.

August 27.—Tenderness still not subdued.

App. hirud. xxiv. scrob. cordis.

August 28.—Slept very little. Pain in abdomen. Pulse 82 sharp. Bowels not opened since yesterday morning.

Venæsectio ad ℥ xij.
Haust. aperiens.

11, p.m. Relieved, but not entirely. His bowels have acted three times to-day.

℞. Hyd. Subm. gr. v.
Pulv. Antim. gr. iij.
Pulv. Opii. gr. ¼.
Confect. q. s. m. et divide in pilulas duas horâ somni sumend.

August 29.—10, a.m. Slept about two hours during the night. Still some pain in the abdomen.

11, p.m. Bowels not opened since yesterday.

Haust. aperiens.

August 30.—10, a.m. Passed a much better night, having slept for several hours. Bowels have acted twice. Pain in the abdomen nearly gone.

℞. Hyd. Sub. gr. i.
Pulv. Antim. gr. ij. m. fiat pulvis bis die sumendus.

August 31.—Perfectly free from pain.

September 1.—Quitted the hospital.

13.—Sarah Thompson, ætat. 35 years, was attacked with vomiting and purging in the evening of the 12th July, 1832. She was admitted into the Cholera Hospital at 6, p.m.

6, p.m. Vomiting and purging, with loss of memory. Left the hospital on the 19th cured.

14.—Mary Harrison, ætat. 36 years, was attacked in the morning of the 1st September, 1832, with vomiting and purging. She was admitted into the Cholera Hospital at 11, a.m., and her symptoms then were :—

11, a.m. Whole surface of the body cold. Eyes sunken, lips livid, pulse hardly distinguishable at the wrist. Fingers corrugated. She says she has had no stools since five this morning, and that they were then like rice water. Vomiting. Cramp. Complains of great pain all over the abdomen and back ; increased on inspiration or pressure. Tongue cold, and great thirst. Says the pain has become much worse since the evacuations have stopped. No urine voided since yesterday.

Ordered—Mustard poultices to the spine and stomach, &c.
Hot fomentations to the abdomen.
And bottles of hot water to the feet.

2, p.m. Warmth quite restored. Pulse perceptible. The pain in the abdomen relieved by the fomentations. Complains very much of pain in the course of the spine. Has had a motion.

Ordered—Mustard poultices to the spine again.

11, p.m. Excruciating pain in the right hypochondriac region and in the back. The purging continues.

Ordered—Emplast. Sinapis part. dolent. applic.
Mustard emetic.

10, a.m. Passed a restless night, but is free from pain this morning, except on pressure.

10, p m. Has considerable pain and tenderness in the epigastrium, extending to the lumbar regions, with desire to make water. Catheter introduced, but no water found in the bladder.

Ordered—Hot fomentations.

℞. Sp. Æther. Nit. ℥ss.
Sod. Carb. ʒ ss.
Mist. Camph. ad ℔ss.
Coch. ij 4tis horis.

3*rd*.—10, a.m. Pain relieved. Says she has made a small quantity of water. Stools feculent. Pulse feeble.

10, p.m. Pain increased on pressure in the region of the bladder.

Ordered—Hirud. xv. Fotus calid. postea.

4*th*.—10, a.m. Pain entirely removed.

5*th*.—10, a.m. Is much better altogether. Quite free from pain, but complains of uneasiness in the head. Bowels open. Made water freely.

Ordered—Hirudines ij. Tempori.
Emp. Lyttæ Nuchæ.
℞. Liq. Ant. Tart. ʒ iij.
Mist. Camph. ad ℥vj.
Coch. ij 3tiis horis.

10, a.m. Slight stupor and pain in the head.

Venæsectio ad ℥ x.
℞. Hyd. Sub. gr. i.
Pulv. Ipecac. gr. ss.
Camp. Aromat. gr. s.
Ft. pil i. 3tiis horis.

September 6.—10, p.m. Uneasiness of the head relieved, but not quite removed. There is slight tendency to stupor. Feels very weak, and complains of the medicine making her feel sick.

7*th*.—10, a.m. A great deal better. Free from pain. Oppression in the head removed. Pulse good, about 80. Tongue moist. Bowels open. Countenance improved.

Ordered—Some beef tea to be given.

8*th.*—10, a.m. Improving. Bowels not open.

Ordered—Ol. Ricini, ℥ss. statim sumend.

9½, p.m. Still better. Bowels have been relieved copiously three or four times. Expresses herself much better than she has been for some time. Pulse full. Tongue rather dry. Wishes for sago and wine.

Ordered—Sago and wine.

9*th.*—10, a.m. Improving.

10*th.*—10, a.m. Convalescent.

Ordered her some mutton, &c.

13*th.*—Bowels not open. Great debility. Tongue white and furry.

Ordered—Ol. Ricinæ ℥ss. statim sumend.

℞. Inf. Gent. ℥viiss.
Tinct. Gent. comp. ʒ ij.
Tinct. Card. comp. ʒ ij.
fiat Mist. coch. ij ter die.

14*th.*—Feels much better this morning, the bowels have acted freely.

15*th.*—Gaining strength. The bowels not open since the day before yesterday.

Ordered—Haust. aperiens statim.

16*th.*—Much better. Leaves the hospital to-day.

15.—Louis Jacomo, ætat. 39 years. Was attacked with vomiting and purging on the 21st August, 1832. He was admitted into the Cholera Hospital at 7, a.m.

7, a.m. Has had constant purging and vomiting during the night. Features shrunk. Eyes sunken. The extremities cold. Skin of the fingers corrugated. Pulse imperceptible at the wrist. Cramps in the abdomen and

legs. Complains of dizziness in the head, and noise in the ears. Whispering voice and anxious countenance.

Ordered—Mustard emetic and mustard poultices.
Hot water bottles to the feet.
Hot fomentations to the abdomen.
Cold water to drink *ad libitum*.

11, a.m. Has not passed a stool since admission. Cramps less violent. Countenance rather improved. Pulse slightly perceptible. Skin warm and moist. No pain in the head. Thirst not very urgent.

Ordered—Hyd. Submuriat gr. x. omni horâ.

2, p.m. Surface of the body rather colder. No pulse. Respiration hurried.

Ordered—The repetition of mustard emetic and poultices.
Pulv. Salinæ, omni semihorâ.

3-30, p.m. Skin warmer. Pulse perceptible.

22*nd*.—9, a.m. Very much better Countenance improved. Skin warm and moist. Pulse firmer. Has taken the powders every two hours, since two o'clock this morning. Has passed a bilious stool.

Ordered—Hyd. Sub. gr. v. 4tis horis.
Mist. Salina 4tis horis.
Beef tea.

23*rd*.—8, a.m. Skin very moist. Has passed no urine since the day before yesterday. Has had no motion since yesterday morning. Countenance flushed. Pulse labouring. Has passed a good night.

Ordered—Venæsectio ad ℥ xii.
Haust. Purgans statim.
Beef tea, coffee, &c.

4, p. m. Blood buffed and cupped. Pulse improved.

24*th*.—10, a.m. Passed a good night. Thought he passed water once or twice with his stools. Pulse about 70. Tongue moist.

12*th*.—Has passed about a pint of urine.

25*th*.—Slept well last night. Improving.

26*th*.—Passed a good night. Is to set up to-day.

27*th*.—Complains of slight giddiness. Mouth sore.

Lotio Aluminis.

29*th*.—Improving in health. Mouth still sore.

Lotio Sodæ Chlor.

30*th*.—Left the hospital cured.

16.—Ann Pollock, aged forty, complained of severe vomiting and purging, occurring during the night of the 22nd August. On the morning of the 23rd there were some symptoms of collapse. I requested her motions might be put by for my inspection, and at 5 p.m. they were of a decidedly gruel-like appearance—and other symptoms of collapse were more marked. I now desired her to go to the Cholera Hospital, whither she was able to proceed walking with the assistance of another person. On going into the ward where three other patients were in bed, she was suddenly seized with the most violent alarm, and after walking up and down the room in a state of considerable agitation, she escaped from the ward and remained in another room down stairs during four hours.

10, p.m. Skin warm. Pulse firm. Countenance much improved. Says she is quite well. She obtained permission to return to the workhouse. The following day she continued to feel herself very well.

August 25.—9, a.m. Has had a return of the vomiting and purging with much greater violence, and is in a state of complete collapse. No pulse at the wrist. Hands and feet cold, blue and corrugated. Features shrunk. Lips livid. Eyes sunk. Cramps. Vomiting and purging of rice water fluid. Urgent thirst.

Sinapisms to the spine, and epigastrium.
Hot water bottles to the feet.
Cold water *ad libitum*.

11, a.m. Retches violently, but does not eject the water.

1, p.m. Pulse perceptible. Surface of body regaining some degree of heat.

2, p.m. Retching still very distressing. Great anxiety of countenance.

8, p.m. Surface colder. Can bear more clothing.

℞. Cataplasma Sinapis scrobiculo cordis.

12, p.m. There is some slight increase of heat again. The lower extremities are cold, and the application of warm bottles is agreeable to the feelings of the patient. Retching continues. Purging has ceased. The skin is dry, except occasionally upon the face.

26*th*.—9, a.m. Retching continued during the whole night. Stomach quieter this morning. Countenance improved. Pulse more perceptible.

1, p.m. Improving. Has passed a clay-coloured motion.

27*th*.—Passed a very restless night. Complains of pains in all her limbs. Stool of darker colour. Urine voided freely.

28*th*.—Better in every respect.

17.—Ellen Ellis, aged fifty, a pauper in St. James's Workhouse, admitted into the Cholera Hospital, 15th

August, 12 noon. Collapse of the features. Lips blue. Pulse very weak. Skin cold and clammy. Vomiting and purging profuse.

Ordered—Mustard emetic.
Bottles of hot water to the feet.
Water for drink.
15 grains of Calomel every hour.

Refuses to take any medicine whatever.

A vein opened with the view of injecting the veins: though the vein was opened blood would only come by single drops at considerable intervals. The injection was not submitted to.

12, p.m. Skin perfectly cold and clammy. Pulse imperceptible at the wrist. Vomiting and purging abated.

16*th*.—9, a.m. Pulse perceptible. Skin cold but not moist.

5, p.m. Vomiting has returned for the first time since early this morning. Legs and trunk warm. Arms cold. Pulse very distinct 80.

17*th*.—9, a.m. Has passed a very restless night. Afraid to drink anything lest it should contain medicine. Surface not quite so warm as yesterday evening. No motion since yesterday. Vomiting continues.

6, p.m. Pulse somewhat hard. Arms still and cold; but there is some degree of warmth about the forehead. Slight stupor.

Venæsectio ad ℥viij.

18*th*.—10, a.m. Blood drawn yesterday black, with a few spots of buff. Coagulum not firm though slightly elevated at the edges. Has passed a better night.

To have a little mutton broth

19*th*.—10, a.m. Tongue covered with a brown fur.

Passed two bilious motions yesterday. Pulse weak. Skin somewhat cold. Great disposition to sleep.

℞. Hydrargyri Sub.
Quin. Sulp. a gr. j : fiat pilula ter die sumenda.

20*th.*—10, a.m. Has passed a good night. Free from pain. Pulse soft and somewhat full. Tongue rather dry. Bowels have acted. Motion well tinged with bile.

21*st.*—10, a.m. Passed a restless night. In other respects much the same.

2, p.m. A quantity of feculent matter tinged with bile passes involuntarily.

℞. Cupri Sulphatis, gr. ¼.
Pulveris Opii, gr. ¼.
Camphoræ, gr. ij. fiat pilula, quarta quaque hora sumenda.

22*nd.*—Little improvement.

Pergat in usu pilularum.

23*rd.*—The colliquative diarrhœa much decreased. From this time she has continued steadily but slowly to improve*.

18.—John Poole, ætat. 50 years, was attacked with purging and cramp on the evening of the 16th August, 1832. He was admitted into the Cholera Hospital at 6 p.m.

6, p.m. Emaciated appearance; purging of rice-water appearance. Cramps in the legs. Pulse weak. Skin not cold.

* This patient drank water freely whenever she was convinced that it contained no medicine.

Ordered—Mustard poultices to the spine and stomach.
Hyd. Submur. gr. x. 2dis horis.
Tea *ad libitum*.

17*th*.—9, a.m. Purging abated. Slept pretty well. Pulse full and soft. Skin warm.

Venæsectio ad ℥x.

6, p.m. Pain in the side increased on pressure, of a dull character. Has passed a motion containing bile.

18*th*.—10, a.m. Blood much buffed; coagulum easily broken. Has passed another bilious motion.

Ordered—Mutton broth with toast.

19*th*.—Tongue clean, and much better.

20*th*.—Convalescent, and left the hospital.

19.—Mary Drew, ætat. 66 years, was attacked with vomiting and purging on the evening of the 7th of September, 1832. She was admitted into the Cholera Hospital at 7 p.m.

7, p.m. Vomiting and purging of a light-coloured fluid. Skin warm. Pulse perceptible at the wrist. Voice natural.

Ordered—Mustard poultices to the spine and abdomen.
℞. Pulv. Ipec. ʒ ss.
Aquæ, ℥iss. ft. haust. emetic. statim sumend.
Cold water to drink *ad libitum*.

Sept. 8.—Cramps severe at times.

8, a.m. Skin continues warm. She has had a great many evacuations during the night, but rather darker. Cramps not so severe. She still continues to vomit.

1, p.m. Stools darker.

Ordered—Beef tea and arrow-root.

10, p.m. Feels low. Stools not so frequent; dark and

fetid. Cannot retain anything on her stomach. She is not sick unless she takes anything.

11, p.m. Complains of a dull pain in the head. Occasional cramp. Skin warm. Pulse good. Tongue rather dry. No urine. She is thirsty, but no fluid is retained by the stomach.

Ordered—Hirudines viii. Temporibus applic.

9*th.*—10, a.m. Passed a restless night. Pain in the head no better. The leeches would not bite. Sickness continues.

Ordered—Mist. Salinæ ℥j tertiis horis.

7, p.m. Has not been sick since the first dose of the mixture.

10*th.*—10 a.m. Head not relieved.

Ordered—Hirud. vj. temporibus applic.
Continue mixture.

8, p.m. Her head is much better since the application of the leeches.

11*th.*—10, am. Head not so well this morning. Pulse rather hard. Pain in the epigastrium.

Venæsectio ad ℥vj.

11, p.m. Blood very much buffed and cupped. Pain in the epigastrium not relieved. Bowels not open since yesterday morning.

Ordered—Ol. Ricini, ℥ss. statim sumend.

12*th.*—10, a.m. Feels better this morning. The castor oil has operated freely. Pain in the abdomen relieved. Head better. Pulse 82; soft. Tongue moist.

13*th.*—10, a.m. Not so well this morning. Pain in the epigastrium.

Ordered—Hyd. Submuriat. ℈i.
Pulv. Ipecac. gr. ss. 3tiis horis.
Venæsectio ad ℥iv.

10, p.m. Pain not relieved. Headache. Complains of want of sleep. Pulse rather sharp.

Emp. Canthar. Epigastrio.

14*th*.—10 a.m. Better. Blister has acted well. Pain in the epigastrium much relieved. Blood drawn last night buffed and cupped. Pulse 80; small. Appetite better.

Ordered—Broth, &c.

Half-past 11, p.m. Complains that she can get no sleep.

Ext. Hyos. gr. v. hora somni.

15*th*.—Slept better. Free from pain, except in the head.

Repet. Pil. (Cal. c. Ipecac.) capiat j. bis in die.

16*th*.—Passed a good night. Mouth sore.

17*th*.—Slept badly last night. In other respects is going on well.

Ext. Hyos. gr. v. hora somni.
Light pudding.

20*t*. Leaves the hospital to-day cured,

20.—William Dixon, ætat. 77 years, was attacked in the morning of the 2nd August, 1832, with vomiting and purging. He was admitted into the Cholera Hospital at 7, a.m., and his symptoms then were:—

7, a.m. He has fainted after an evacuation. Has been lying in St. Philip's Chapel during the night, which was undergoing repair. Pulse nearly imperceptible. Skin warm, moderately. He was now carried to the Cholera Hospital.

Ordered—Ol. Ric. ʒ iij.
Ol. M. Vir. m. i.
Aquæ ʒ v. statim sumend.
Mutton broth. Arrow-root. Tea, warm, *ad libitum*.

9, a.m. He has become warmer on being put to bed. Pulse full. Has passed a bilious motion. Has made water this morning. Feels much better.

Ordered—Mist. Conf. Aromat. ℔ss.
ʒj pro. re nata.

6, p.m. Has passed motions very frequently during the day, all tinged with bile. Skin warmer than natural.

Ordered—Pil. Saponis c. opio gr. vii.
fiat suppositor.

10, p.m. Bowels are not quieted.

3*rd*.—8, a.m. The bowels have been much less relaxed during the night. Skin still warm. Appearance of congestion about the head, which is somewhat hot.

Ordered—Hirudines iv. temporibus.

1, p.m. Bowels have continued relaxed from time to time.

6, p.m. Died quite sensible at 11, p.m.

21.—Mary Priest, ætat. 76 years, was attacked with purging on the morning of the 18th of August, 1832. She was admitted into the Cholera Hospital at 12 at noon. Her symptoms then were—

12, Noon. Purging of rice water appearance, whispering voice, skin cold, emaciated countenance, and has passed no urine since yesterday afternoon.

Ordered—Mustard poultices.
Hyd. Sub. gr. xv. omni hora.
Tea and water to drink *ad libitum*.

11, p.m. The right arm has recovered its heat, the left continues cold, purging has ceased, pain in the region of the umbilicus.

Ordered—Hot fomentations to the abdomen.

19*th.*—10, a.m. Skin nearly recovered its natural heat, voice stronger, has passed a yellowish motion.

Repeat Calomel.
Arrow-root and beef tea, *ad libitum.*

10, p.m. Head confused.

Ordered—Hirudines vi. temporib.

20*th.*—10, a.m. A little better, tongue dry, pulse 70, has passed two bilious motions.

Ordered—Liq. Am. Acet. ℥ii.
Mist. Camph. ℥vi. sumat ℥j 6tis horis.
Beef tea, &c., as usual.

21*st.*—10, a.m.Complains of difficulty in swallowing, referred to the lower region of the œsophagus.

Ordered—Emp. Canth. parv. sterno.

22*nd.*—Going on well.

23*rd.*—Tongue brown and dry.

Ordered—Cal. gr. ii.
Pulv. Ant. gr. i. ft. pil. 4tis horis.

25*th.*—Tongue improved, she asks for meat and ale.

26*th.*—She has been gradually sinking since the last report and occasionally delirious.

27*th.*—Death.

22.—Eliza Sherridan, ætat. 75 years, was attacked with vomiting and purging in the morning of the 22nd of August, 1832. She was admitted into the Cholera Hospital at 1, a.m.

23*rd*.—1, a.m. Has had rice water stools and vomiting. Cramps violent. Delirium. Some warmth about the head.

Ordered—Mustard poultices to the stomach and spine.
Saline mixture and cold lotion to the head.

5, a.m. Death.

23. Mary Mills, ætat. 72 years, was attacked in the evening of the 11th of August, 1832, with vomiting and purging. She was admitted into the Cholera Hospital at 7, p.m.

7, p.m. Purging profuse, like rice water, skin cold, pulse nearly imperceptible.

Ordered—Hyd. Submuriatis gr. xv. omni hora.
Mist. Salinæ ℥ss.
Coch. ij. omni hora.
Mustard poultices to the stomach and spine.
Tea, barley-water, or cold water, *ad libitum*.

9, p.m. Worse in every respect. Cramps severe.
12*th*.—Death.

24.—William Price, ætat. 72 years, was attacked with vomiting and purging, in the evening of the 3rd of September, 1832. He was admitted into the Cholera Hospital at 10, p.m.

10, p.m. Was very well at three o'clock, previous to admission; but soon after he was attacked with vomiting and purging, giddiness, &c. Is now in a state of collapse. Voice a mere whisper.

Ordered—Mustard poultices to the spine, and stomach.
Hot water bottles to the feet.
Pulv. Emetic. statim sumend.

11, p.m. Pulse perceptible at the wrist, feels rather thirsty, extremities warmer.

Ordered—Cold water to drink, *ad libitum.*

11, a.m. Breathes with difficulty.

Ordered—Mustard poultice to the chest.

2, p.m. Comatose. Mustard poultice had no effect. Death.

25.—Mary Evans, ætat. 70 years. Was attacked in the evening of the 11th August, 1832, with vomiting and purging. She was admitted into the Cholera Hospital at 7, p.m.

7, p.m. Purging profuse. Pulse weak. Skin still warm. Voice weak. Thirst.

Ordered—Hyd. Sub. gr. xv. statim et rep. omni horâ.
Mist. Salina.
Tea, barley water and cold water, *ad libitum.*
Mustard poultices to the spine and stomach.

9, p.m. Vomiting occasionally, not excessive. Purging still profuse. Voice whispering. Pulse nearly imperceptible. Skin cold and moist.

12*th.*—Death.

26.—Mary Drake, ætat. 68 years. Was attacked in the evening of the 5th August, 1832, with vomiting and purging. She was admitted into the Cholera Hospital at 7, p.m., and her symptoms were—

7, p.m. Countenance greatly emaciated. Eyes much sunken. Skin quite cold. Voice whispering. Thirst. Has been purged excessively. Pulse nearly imperceptible.

Ordered—Mustard poultices to the spine and stomach.
Saline mixture.
Hot barley water.

10, p.m. No improvement.

Ordered—Sp. Terebinth. ℥iss.
Aq. Calid. ad ℔iss.
Ft. Enema, Dimid. statim injiciend. et post horas tres repet.

6th.—6, a.m. Has passed a restless night, and is in every respect worse. Pulse quite imperceptible.
6, p.m. Death.

27.—William Ainsley, ætat. 67 years. Was attacked with vomiting and purging, in the morning of the 22nd of August, 1832. He was admitted into the Cholera Hospital at a quarter-past 7, a.m.
7.15, a.m. In a state of collapse. Vomiting, purging, and cramps. No pulse. Voice whispering.

Ordered—Mustard poultices and mustard emetic.
Hyd. submuriat. gr. x. omni hora.
Mist. salina, omni semihora.

23*rd*.—9, a.m. Features shrunk. Surface cold. Skin dry and warmer. Cramps severe, particularly about the loins. Tongue and breath cold. Pulse just perceptible.

Ordered—Cold water to drink *ad libitum*.

12, a.m. Much the same.

Repeat mustard emetic.

5, p.m Continues to get worse.
6, p.m. Death.

28.—Martha Stubbleday, ætat. 59 years, was attacked in the morning of the 14th August, 1832, with purging and vomiting. She was admitted into the Cholera Hospital at 11 a.m.

12 noon. Blueness of the lips. Warm. Collapse of the fingers and countenance. Purging, of rice-water appearance. Oppression of the chest.

Ordered—Mustard poultices to the spine and stomach.
Saline mixture.
Hyd. Submuriat gr. xv. omni hora.

4, p.m. Death.

29.—Mary Jenkins, ætat. 56 years, was admitted into the Cholera Hospital on the 8th July, 1832, at 9, p.m., and her symptoms were:—

9, p.m. Collapse. Vomiting and purging. Pulse imperceptible. Skin cold and clammy. Thirst. Blueness of the extremities. Eyes deeply sunken.

Ordered—Cataplasmata Sinapis Spinæ & Sc. Cor.
Cold water *ad libitum*.
Hyd. Sub. gr. xx. omni hora.
Mist Salinæ ℥ss.
Coch. ii. 2dis horis.

18*th*.—3, a.m. Death. Duration of attack, six hours.

30.—Rachael Wood, ætat. 55 years, was attacked with purging in the morning of the 17th August, 1832. She was admitted into the Cholera Hospital at 2, a.m., and her symptoms were then:—

2, a.m. Perfect collapse. Evacuations like rice-water.

Ordered—Mustard poultice to the spine and stomach,
and mustard emetics.
Tea and cold water for drink *ab libitum*.
Hyd. Submur. gr. xv. omni hora.

10, a.m. Vomiting and purging have abated. Pulse imperceptible.

10, p.m. Pulse can now be felt at the wrist. Skin still cold. More thirst—inclination for cold water. Vomiting not returned.

Ordered—Mutton broth.
Repet. pulv.

18*th*.—10, a.m. Pulse perfectly distinct. Skin regained some degree of warmth. Expresses a desire for broth. Has passed two motions of black fluid, with similar deposit to that observed in the rice-water stools.

19*th*.—10, a.m. Pain in the head. Heat about the forehead. Bowels have not been acted upon since yesterday afternoon. Dark coloured mucus, small in quantity, comes from the stomach.

Ordered—Venæsectio ad ℥viii.
Lotio frigid. fronti.
Haust. aper. c. Inf. Sennæ ℥i statim.

Blood drawn, buffed and cupped, coagulum firm.

11, p.m. Pain in the epigastrium, increased on pressure, pulse feeble at the wrist, occasional fainting.

Ordered—Hirud. viij. sc. cordis.
A little brandy and arrow root when faint.
Port wine, egg and water.

23*rd*.—10, a.m. In a very low state, pulse feeble, no inclination for food.

11, noon. Pain in the epigastrium increased on pressure. Intolerance of aliment by the stomach.

Ordered—Hot fomentations. Enema of
Beef tea and arrow root twice a day.

21*st.*—9, a.m. Has passed a very bad night, great pain over the epigastrium, increased on pressure. Hot fomentations have been constantly applied, without affording much relief.

Ordered—Emp. Lyttæ epigastrio.

22*nd.*—The blister had no effect, complains of pains all over.

Repeat the injection of beef tea and arrow root.

23*rd.*—Slight delirium.

Takes no nourishment by the mouth.

24*th.*—Died at a quarter before eight.

31.—Edward Barrow, Porter, ætat. 52 years, was attacked in the evening of the 19th July, 1832, with purging and vomiting. He was admitted into the Cholera Hospital at 12 at noon.

12, noon. Purging and cramps, cold skin, pulse nearly imperceptible. Vomiting of watery fluid, of which the purging also consists.

3, p.m. Skin warmer, pulse stronger, thirst continues, but not so great.

Ordered—Mustard poultice to the spine and pit of the stomach, warm bottles to the feet.
Saline mixture.
Calomel ℈i. omni hora.
Water *ad libitum.*

5, p.m. The skin has become colder; he has insisted upon the bottles being taken away from hsi feet,—he is very restless.

Ordered—A little wine and water occasionally and broth.

10, p.m. Sickness increased, pulse weaker, purging continues, and cramps.

12, p.m. Wine to be discontinued. Broth to be given warm. Warm water to quench the thirst; and saline mixture.

20*th*.—7, a.m. Skin cold, pulse imperceptible, sickness not so great. The last motions have been very offensive, and to all appearance like blood and jelly.

10, a.m. Death.

Duration of attack, two days.

32.—Ellen Ross, ætat. 41 years, was attacked in the morning of the 10th July, with purging, vomiting and cramps. She was admitted into the Cholera Hospital at 10, a.m., and her symptoms were—

10, a.m. Purging and vomiting of a gruel-like fluid. Cramps in the legs and epigastrium. Countenance sunken and blue, hands blue, fingers shrivelled. Thirst excessive.

12, noon. Continues to sink.

Ordered—Ammon. Carbonatis, gr. x.
Mist. Camphoræ, ℥iss,
Ft. Haust. statim, et pro re nata repet.
Cataplasmata Sinapis Spinæ et Sc. Cord.

2, p.m. Pain in the epigastrium. Shrivelling and blueness increased.

Ordered—Sodæ Mur.
—— Carb. āā ʒi.
Pot. Nitrat. ʒ iss.
Mist. Camph. ℥ viii.
Coch. ii. omni hora sumend.
Saline injection of the veins to two pints.

4, p.m. No reaction, and death at half-past 4, p.m. Duration of attack, six hours.

33.—Elizabeth Bell, ætat. 33 years. Was attacked with vomiting and purging, in the morning of the 23rd of August, 1832. She was admitted into the Cholera Hospital at 11, a.m.

11, a.m. Vomiting and purging of rice water fluid. Skin cold. Pulse imperceptible. Fingers corrugated. Eyes depressed. Severe cramps.

Ordered—Hyd. submuriat. gr. x. omni hora.
Mustard emetic, mustard poultices.
Saline mixture, and
Cold water *ad libitum.*

4, p.m. Vomiting and purging have abated. Skin still cold, though not so much so in the lower extremities. Covered profusely with moisture. Some disposition to sleep.

Venæsectio ad ℥vj.

24*th.*—10, a.m. Blood slightly buffed. Respiration more free. Vomits a great quantity of green bile. Skin warm. Pulse improved.

Ordered—Broth *ad libitum.*

25*th.*—No appetite. Thirsty. Vomits still green bile.

26*th.*—Still vomits green bile. Pulse more languid. General lassitude. Disgust at the very idea of food. Has not passed urine since admission. Bowels have slightly acted. Motions dark.

Ordered—Arrow-root, lemon juice, or wine at pleasure.
Haust. aperiens statim.

Half-past 1, p.m. The draught was rejected immediately

8, p.m. Has passed no urine since her attack.

Ordered—℞. Hyd. sub. gr. v.
Pulv. Opii. gr. ¼.
Ft. Pil. 4tis horis sumenda.
℞. Sp. Æth. Nit. ʒ iij.
Sodæ Carbon. ʒ ss.
Pot. Nit. ʒ ss.
Aquæ ad ℥vi.
Coch. ii. 4tis horis.

27*th.*—10, a.m. Has passed a very bad night. Vomiting not at all diminished. Hiccough. No urine. Catheter introduced, and urine drawn off.

Omit mixture.
℞. Sodæ Carb. gr. xx.
Pot. Nit. gr. v.
Sp. Æth. Nit. gr. xxx.
Acid. Tart. gr. xx.
M. Haust. effervescens omni hora.

10, p.m. Urine drawn off three times a day. Slight delirium.

Ordered—Hirud. vj. tempor.

28*th.*—10, a.m. Delirium increased.

Ordered—Emp. Canthar. nuchæ.
Venæsectio ad ℥vj.
℞. Hyd. sub. gr. iv.
Ext. Hyos. gr. iv. 4tis horis.

12, a.m. Cannot be induced to take the medicine. Considerable disposition to stupor.

Venæsectio ad ℥viij.

4, p.m. Blood drawn in the morning buffed, though but slowly taken from the arm.

10, p.m. Blood drawn again buffed, and firmly coagulated.

29*th.*—10, a.m. Has been very delirious during the

night. Her hands were confined in consequence of her wounding herself with her nails on her chest and face. Unable to swallow.

9, p.m. Has been in a state of coma all day, and died at half-past 8, p.m.

34.—Margaret Gardiner, ætat. 29 years, was attacked with vomiting and purging in the evening of the 28th of August, 1832. She was admitted into the Cholera Hospital at 2, p.m.

2, p.m. Appears to be just recovering from collapse. Eyes deeply sunken. Pulse perceptible. Passed no urine yesterday, but has done so two hours since admission.

Ordered—Sinapisms and hot water bottles to the feet.

℞. Hyd. Sub. gr. ij.
Pulv. Ant. gr. ij.
Ft. Pulv. 4tis horis.
Hirud. viij. scrob. cord.
Emp. Canth. postea.

4, p.m. Has now some pain at the pit of the stomach.

Venæsectio ad ℥viij.

11, p.m. The blood drawn buffed and cupped; the leeches bled freely, and she was well fomented.

29*th*.—Blister not yet applied.

10, a.m. Pain rather better. Has had no sleep during the night, but has not been at all restless.

12, noon.—She aborted suddenly; fœtus about four months. Pain in the region of the stomach has quite left her. Feels comfortable. Pulse weak and frequent.

10, p.m. Placenta has come away. She is much the same. Makes water freely.

Ordered—Liq. Am. Acet. ℥ij.
M. C. ad ℥viij.
Coch. ii. 4tis horis.

30*th*—10, a.m. Passed a pretty good night. No pain. Pulse 78, full and bounding. Tongue clean and moist. No appetite. Thirst less urgent. Complains of a sense of weight across the forehead.

Ordered—Hirudines iv. tempor.

4, p.m. The leeches have bled freely. Head relieved. Catheter introduced and water drawn off.

9, p.m. Head is again inclined to stupor. Pulse gives a dull, hard sensation.

Ordered—℞. Hyd. sub. gr. j.
Pulv. Ant. gr. ij.
Pulv. Ipecac. gr. iv.
Ft. Pil. 4tis horis.
Applic. Hirud. viij. tempor.

31*st*.—10, a.m. Stupor increased. Pulse labouring. Catheter still required.

Ordered—℞. Hyd. sub. gr. iij.
Pulv. Ant. gr. ij.
Pulv. Ipec. gr. j.
Ft. Pil. 4tis horis.

1, p.m. Stupor not diminished. Stools of a brown colour. Urine passed naturally.

Ordered—Emp. Canth. Nuchæ.
Ung. Hyd. Fort. ʒj. to be rubbed in twice a day.

Half past 11, p.m. Better. Mouth becoming sore.

Continue treatment.

Sept. 1.—10, a.m. Passed a restless night, but is much

better this morning. Pulse 96; softer. Bowels open. Mouth very sore.

Omit. Unguent.

5, p.m. There still remains some slight stupor. Mouth very sore. Tongue rather dry.

App. Cucurb. Cruent. ad ℥vj. nuchæ.
℞. Pulv. Ipecac. gr. iss.
Pulv. Ant. gr. iij.
Hyd. sub. gr. ss.
Ft. Pil. 3tiis horis.
Rep. Mist. Feb.

Half-past 10, p.m. No blood obtained by the cupping.

2nd.—Rather better. Complains of want of sleep.

Ordered—Ext. Hyos. gr. iij.
Camphor. gr. ij. hora somni.
Arrow root, brandy, beef tea, &c.

3rd.—10, p.m. Much the same. There is great debility and want of sleep.

4th.—10, a.m. No sleep during the night. Complains of difficulty of swallowing, much thirst, and will drink nothing but water.

Ordered—℞. Tinc. Hyos. ʒ ss.
Tinc. Opii, m. viij.
Liq. Am. Acet. ʒ iij.
Mist. Camph. ad ℥iss. hora somni.

9, p.m. Has taken some beef tea and arrow root during the day. Has had a great number of feculent stools; they come away involuntarily. Great debility.

Ordered—℞. Am. Carbon. gr. xv.
Mist. Camphor. ad ℥vi.
Coch. ii. 4tis horis.
℞. Cupri sulph. gr. iij.
Camphor. ℈j.
Pulv. Opii, gr. iij.
Ext. Hyos, q.s.
Divide in Pil. xij. i. 3tiis horis.

5th.—10, a.m. Death. She sank gradually, and was conscious to the last.

The following case, which occurred in 1834, illustrates the fact that an apparently hopeless case may recover in accordance with the principles which I have attempted to inculcate:—

A woman, aged forty, residing in Ham Yard, Windmill Street, had been in close attendance for three days, on her husband, who was affected with Cholera. On the morning of the fourth (Aug. 18th, 1834), after the commencement of her husband's attack, she became violently affected with the disease. She took nothing but water during the day, having observed its beneficial effect in her husband's case, but towards evening she became intensely collapsed, and so altered in appearance, that those who were intimate with her could not recognise her. There was now no thirst, no power of speech; and though the mind continued sensible, there was extreme indifference to every thing, and altogether a state nearly approaching dissolution. We induced her to drink a small quantity of a solution of culinary salt; but drinking being attended with painful effort, but little was swallowed. We directed that she should be kept perfectly tranquil, and any inclination she might evince for drink, carefully watched and attended to. The window was kept

wide open, and the covering on her person was extremely light. On leaving the patient, we explained that, if any change for the better took place, it would be manifested by vomiting. Three hours afterwards, vomiting took place, the thirst returned, she was supplied with drink from the spout of a tea-pot, and a basin so placed at the bedside to receive the egesta, as that the recumbent posture was strictly preserved. The vomiting continued three days. Some slight pain in the head gave occasion for a moderate bleeding and the application of leeches;—the woman ultimately perfectly recovered.

These cases clearly show that simple congestions and inflammations are the real sequelæ of Cholera, and they completely contradict the opinion entertained by some writers, that their nature is that of specific fever, for by this term is implied an assemblage of phenomena which cannot be controlled so directly by bleeding and active antiphlogistic remedies.

In all these cases cold water was allowed *ad libitum*, and the feelings of the patients, with regard to temperature, were strictly studied, especially as relating to external applications.

In the "Lancet" of 24th September, 1842, I suggested that "a disease, with so specific a character as small pox, may be recognised whether it be severe or mild—whether the patient be covered with eruption and die of its malignity—or whether it be so mild that, but for the appearance of a few pustules, the patient would not know that he was affected with any disease; but, with regard to Cholera, it is only by a careful induction from all the facts connected with it that this question can be answered.

"Some observers have remarked that, during epidemics of Cholera, the attendants of Cholera hospitals and others

were the subjects of diabetes. I believe it to be highly probable that diuresis is the mildest mode in which the influence of the choleraic poison is capable of being displayed. If the heart's action be suddenly depressed from any cause, the congestion which would otherwise ensue is immediately relieved by excretion, or syncope, or coma would probably result. A person labouring under the influence of fear, while he feels oppressed at the præcordia, is attacked with diuresis; a more intense fear is attended with diarrhœa and cold clammy sweats. The effect of digitalis in arresting the action of the heart is well known, and it is in daily use for moderating the heart's action, and also as a *diuretic*."

The following case presents a remarkable corroboration of this view, and, as it is also replete with facts illustrating the truth of the general principles enforced in this book, while the reporter of the case obviously entertained very different views, I have introduced it here as affording unbiassed testimony:—

Extract from "The Lancet," August 11, 1849.

"A lad, aged 18, healthy; living well, and temperate in habits; admitted on the 24th of July, at 3, a.m., having had purging from one the preceding afternoon, and taken medicine for diarrhœa. Had vomiting just before admission. Came in rather cold, but tongue hot and dry. Had *micturition* along with purging to a most extraordinary extent the day before he came. Attributed his attack to being out fishing on the 22nd, and taking cold.

"*Treatment*—Enveloped in cotton, hot bottles to hands and feet. Salines and ice *ad libitum*, with two drachm doses of brandy, and beef tea at intervals; bicarbonate of potash, two scruples; spirits of wine, two drachms; ice water, two ounces.——Mix.—Citric acid, half a drachm; water, one ounce, for an effervescing draught every half hour.

" Hot air-bath at intervals. Purging less. Vomiting incessant up to 2, p.m. Tongue and extremities icy cold. Drinks large quantities of iced water, and vomits immediately. Purging frequent.

" Tincture of krameria, one drachm; strong infusion of logwood, an ounce and a half; chalk, 10 grains; trisnitrate of bismuth, 10 grains, every hour.

" 3, p.m. Vomiting incessant, purging gradually getting less, comatose at intervals.

" 4, p.m. Vomits everything, drinks much iced-water, continuing effervescing mixture only. Purging ceased. Hot air-bath still used at intervals. Pulse 114, and small. Respiration 20.

" 4, p.m. Purged a little.

" Ordered—Olive oil, two ounces.

" Immediately vomited it; oil repeated twice, at intervals of half an hour, but returned directly. Cramped. Mustard poultice to epigastrium. No micturition since he came in. Introduced catheter, and drew off one ounce. Urine not albuminous, and dark in colour. Injected into bladder a solution of chlorate of potash, and again at 7, p.m.

" 25*th*.—7, a.m. No change in patient. Twice purged through the night. No abatement of vomiting. Had a solution of carbonate of soda, instead of effervescing mixture at intervals. Pulse rather stronger. Says he micturated once in the night, and was rather cramped.

" 5, p.m. Pulse 132. Tongue warm. Twice purged since last report. Feet warm, hands blue, and icy cold. Face dusky. Vomiting unabated. Drinks a quantity of iced water.

9, p.m. Once purged, and vomited all given. Thirst extreme, as it has been throughout.

" 11, p.m. Vomiting unabated, but now of a grass green colour. Pulse getting weaker. Purging returned.

"Ordered—Instead of effervescing, camphor mixture, two ounces; aromatic spirit of ammonia, twenty minims, every hour; the bismuth mixture every hour.

"*26th.*—3, a.m. Purging less. Vomiting unabated. Appears sinking from exhaustion. Reduced the doses of both mixtures until the stomach would retain, which was half a tea spoonful, and repeated every five minutes; this was attended with the best possible effect. Vomiting ceased, also purging. Lips began to assume natural colour.

"5, a.m. Getting comatose. Face dusky. Hands blue and cold. Gave a full dose of the camphor, &c. mixture, which was followed by instant vomiting, which removed coma. Again gave small doses, and at intervals a large one, for the same purpose; this treatment was pursued for twenty-four hours, when the patient lost all choleraic symptoms, and had an attack of fever. Had the effervescing mixtures, and after it left him ammonia and brandy. Is now nearly well; the stomach will not yet bear much fluid at a time.

"*August* 4.—This case was extraordinary *from the immense quantity the man vomited*, and for the length of time the blueness, vox choleraica, etc. continued. He had strong beef tea given at intervals throughout the treatment. His evacuations were rice-water-like, until the logwood coloured them. The chlorate of potash injections were not persisted in, as they gave him great pain."

Report of some Examples which occurred in 1849.

Case 1.

Daniel Wicker, ætat. 22, of good health and temperate habits, was seized suddenly on September 2, 1849, at

4, a.m., with purging. At half past 7, a.m., he was admitted into the Cholera Hospital, at which time the following symptoms were noted down:—Rice water purging, cramps, occasional vomiting, skin cool, pulse feeble. It appears that, before admission, he had had some brandy given him by the police, who brought him to the hospital.

11, a m. Has been purged several times, not very thirsty, but has taken since last seen about three quarts of water. Has vomited from time to time. Skin cold.

1, p.m. Has been purged once since last seen, motion resembles rice water. Has not vomited. Has violent cramps.

Ordered—℥i. common salt as an emetic.

2, p.m. The emetic acted, but vomiting has not continued. Has been purged twice. Has taken three pints more water.

Ordered—Mustard emetic, mustard poultices to belly, spine, and pit of the stomach.

2½, p m. His skin is very cold, as is also his breath. He complains of extreme heat. His voice is somewhat improved, and altogether perhaps he is a little better. Has vomited a little.

5½, p.m. Skin cold as ice. Has not vomited at all during the last three hours. No thirst. His lips are blue, fingers corrugated. Complains of heat throughout his body, and is tossing off the clothes. He has not been purged during the last three hours. Has had scarcely any cramp.

12, p.m. Intense collapse, no vomiting or purging, no cramps. Perfect sensibility, and an apparent indifference about the result of his case. He is not thirsty.

Sept. 3.—7½, a.m. Death. Duration of attack, 24 hours.

Case 2.

Mary Stuckey, aged 56, widow, residing at 28, Little James Street, of previous good health and temperate habits, was attacked suddenly September 3rd, 1849, at 6, a.m. with purging, vomiting, and cramps two hours afterwards. She had been in perfectly good health up to this time.

Admitted into the Cholera Hospital same day at 1, p.m. Her state then was,—

Collapse. Tongue clean. No pain except from occasional cramps in her legs. A small quantity of colourless clear fluid escapes from her bowels. She has not vomited since 12 noon. Her skin is oool, whilst she herself complains of heat. Great thirst.

Ordered—An ipecacuanha emetic.

3, p.m. The emetic acted, but she has not vomited since. Her skin is very cold. Very little discharge from the bowels. Thirst continues; takes water and ice.

5, p.m. No effort at reaction. There has been no vomiting, and the thirst is not very great.

6, p.m. The collapse is still more intense. The surface of her body is icy cold. Her tongue and breath are also very cold.

September 4th.—Half-past one, a.m. Death.

Duration of attack, 19½ hours.

Case 3.

Mary Edwards, ætat. 11, a cripple, who had had resection of the hip joint performed upon her some months previously. Of weak delicate health, and bed-ridden for several months; was attacked 6, p.m. August 13th, 1849, with purging and vomiting. She occupied a bed in a ward of St. James's Infirmary, opposite to that in which a Cholera patient had died the day but one previously.

At 9, p.m. There was no purging, but she vomited frequently. She was very thirsty and drank frequently of water. Her skin was warm and pulse perceptible.

August 14*th.*—11, a.m. Purging has returned, and she is passing motions resembling gruel. Her eyes are sunk. Skin cold. Vomiting continues, but without the slightest effort. Thirst continues.

7, p.m. Collapse more severe. Takes cold water incessantly, which is immediately rejected by vomiting, but still without effort.

August 15*th.*—11, a m. Purged but twice since last seen, the last motion slightly tinged with green. Vomiting continues of a brown fluid. Complains frequently of cramps in her legs. Her skin and breath are now quite warm. Pulse very good. Thirst has ceased. Has not yet passed any urine. Drowsiness, and symptoms of congestion about the head.

Ordered—Calomel and antimonial powders.

11, p.m. No purging nor vomiting. Her skin is warm, and pulse good. Still drowsy.

Ordered—To repeat the calomel.

August 16*th.*—1, p.m. Has passed about 10 oz. of urine. No drowsiness; perfect sensibility. Has been once purged. Has vomited a small quantity of dark grumous fluid.

August 17*th.*—12-30. Has passed a natural bilious motion. No vomiting nor thirst. Pulse 100, and skin warm.

18*th*—Convalescent.

Case 4.

Elizabeth Withers, ætat. 24. Previous health good; habits temperate; brought in 10, a.m., *September* 15*th*, 1849, in a state of collapse. Some purging but vomiting profusely; pulse almost imperceptible. Skin cold. Eyes sunk.

11, a.m. Feeble pulse. Skin warmer. Eyes still sunk. Vomiting. Thirst.

1, p.m. Has not been purged since last seen. Intense thirst. Vomiting continues.

To have cold water *ad lib.*

8, p.m. Has passed some urine. Pulse is good.

September 16*th.*—10, a.m. Has been purged three times in the night, passing a small quantity of yellow-coloured fluid from the bowels.

17*th.*—Takes arrow root and beef tea. Passes urine freely. No motion.

To have a chop to-morrow.

18*th.*—Quite well.

SOME EXAMPLES WHICH HAVE OCCURRED IN 1853.

HENRY HOPCROFT, ætat. 17, employed as a coal porter, and residing at 4, Kemp's Court, states that he has been affected with diarrhœa for four days, and has been purging and vomiting throughout the night.

October 15*th.*—2, p.m. He now presents the following symptoms:—Pulse scarcely perceptible. Face of a dusky hue. Eyes sunk in the orbits. Intense thirst. Skin cold. He is purged about every twenty minutes, and vomits still more frequently He was allowed cold water to drink *ad libitum*, and a mild carminative was prescribed.

6, p.m. Skin moderately warm. Has been purged but three times, but vomits frequently.

16*th.*—11, a.m. Purged twice during the night. Vomits after every thing taken.

17*th.*—Purging ceased, but vomiting continues.

18*th.*—Vomiting ceased. He complains of pain in the stomach and head. He was ordered a moderate application of ice to his head, and,

℞. Hyd. Subm. gr. ij.
Pulv. Antim. gr. iij.
4tis. horis sumend.

To have linseed meal poultices over the stomach.
To take beef tea, arrow root, milk and water.

19*th.*—Pains in the head and stomach have subsided.

To discontinue the powders.

20*th.*—Convalescent.

A case which occurred in an adjoining room, that of Charlotte Simmons, ætat. 41 years, the mother of five children, was exactly of the same character, except that the sequelæ were congestion about the abdomen and colliquative diarrhœa, which readily disappeared under treatment.

Margaret Stanton, ætat. 21 months, residing at 25, Peter Street, was found in the afternoon of October 26th, 1853, in a state of complete collapse, purging and vomiting incessantly, pulse imperceptible, skin cold. She was very thirsty, and was allowed to drink freely of cold water, and a simple carminative was administered.

October 27.—9, a.m. She has been purged three times during the last twelve hours. The vomiting continues very frequently. Pulse perceptible, but extremely feeble.

October 28.—Pulse small. Purged three times during the last twenty-four hours. Vomits at intervals. Skin moderately warm.

October 29.—Purged very little. Motions tinged with bile. The secretion of urine, till now suppressed, has returned.

Some bilious diarrhœa continued for a few days, and she eventually perfectly recovered.

In the deaths which occurred at this period, the phenomena were characterised by a desire for *warm drinks,* and relief was afforded by heat applied externally. There

was but little vomiting, and attempts to induce it repeatedly failed; nor was the purging very profuse, at least after the cases fell under my observation. In one of these, some of the last evacuations consisted of pink fluid. In all the cramps were not very violent.

POSTSCRIPT.

In reasoning about the mode of death by failure of the heart's action, paralysis of the heart may be defined 'abolition or great diminution of its motions.' There is a source of fallacy which deserves attention.

It is supposed, by some writers, that there is no paralysis of the heart if the ventricles be empty, and especially if the heart displays irritability after death.

This doctrine is, indeed, inculcated in books, that is, when animals are *rapidly* destroyed by poisons; but in the experiments which I have made with poisons which certainly produced abolition, or at least great diminution of the heart's motions, and where death resulted in about two hours, the heart was found pulsating violently after death.

What then is the explanation of the post-mortem contradiction? It appears to me to be this:—When poisons exist in the blood, which exert a depressing influence on the heart's action, the effect is produced on the nervous tissue by the presence of the poison, which occasions a languor of the circulation through the whole vascular system; but little blood reaches the heart, and it is but feebly expelled, although this act is really accomplished. But there is no reason why the heart may not recover its irritability after the circulation has ceased, and which may then continue as long as in the case of other kinds of violent death; its motions being now confined to muscular contractions, and no longer burthened with the circulation of a noxious fluid.

We view in this the same kind of phenomenon as that exhibited in Cholera by the post-mortem radiation of heat to the surface, which is simply the equalisation of the temperature of the whole body according to chemical laws; the previous coldness of the surface being a vital condition.

This also explains why the circulation rallies under injections of water; a diluted poison may be reasonably expected to possess diminished force. Of course, this is not to be supposed to imply an argument in favour of the *curative* agency of injections into the veins, which is a question of another kind.

Let me remind the reader, too, that the alteration of the blood, as far as its physical condition is concerned, may be a reason why the mind retains its powers in Cholera; although, when the circulation fails under a normal condition of the blood, as in the case of syncope, the consciousness is lost.

In conclusion, I have only to add that the plan of this treatise extends no farther than to deal with the nature of the disease. I must refer those who desire important information on the Statistics of Cholera to the very valuable Report of the Registrar-General—a work which is no less remarkable for the extent of its data and the scope of its objects, than for the ability and condensation with which it is executed.

FINIS.

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